ARTISAN

.. The Magazine of

RESIDENTIAL AIR CONDITIONING

WARM AIR HEATING . SHEET METAL CONTRACTING



sales premotion tool page 40

"I was installing these Field Controls before you were born, son

No one knows better than a heating man's son



You have put your faith in field



more than 15,000,000 times



FIELD CONTROL DIVISION of H. D. CONKEY & COMPANY, MENDOTA, ILLINOIS Affiliates: CONCO BUILDING PRODUCTS, INC. + Brick, Tile, Stone CONCO MATERIALS HANDLING DIVISION + Cranes, Housts REPRESENTED IN CANADA BY ONTOR LABORATORY LTD., 111 TYCOS DRIVE, TORONTO 10, ONTARIO

Take pride and profit

in installing

PLIOTRON

"the filter that's more than a filter"

PLIOTRON is the world's first fully washable, paneltype, electrostatic air filter. It's a super-efficient filter you'll take pride and profit in installing in every home, office building, store or plant with an air conditioning or forced warm air heating system.

PLIOTRON is much more than an ordinary filter. Its special plastic filter medium actually attracts and captures up to 400% more fine dust and dirt particles than ordinary air filters. Moreover, PLIOTRON depthloads rather than surface-loads for longer, more efficient service between cleanings. And it lasts

indefinitely—can be restored, when finally dirty, to like-new efficiency with a quick bath—no messy oiling required.

PLIOTRON costs more at first than ordinary filters. But its added cost is more than made up by its added efficiency and added life, plus simplicity of installation and maintenance. For details, write to Goodyear, Pliotron Sales Dept., Akron 16, Ohio.











GOOD YEAR

Pliotron -T. M. The Goodyear Tire & Rubber Company, Asron, Ohio

THE GREATEST NAME IN RUBBER

AMERICAN

JUNE 1957

FEATURES

Two Point Plan Builds Million Dollar Business	40
Certificate Identifies You As Authority on Cooling	44
Keep Blower Fit for Top Cooling Performance	46
Cooling Study Finds Ways to Stabilize Temperatures	50
Why and How to Install an Outside Air Intake	55
SMACNA Points to Bright Future for Contractors	58
Humidifier Sales Soar with Call-Sell-Install Idea	62
Technical Conference Previews Tomorrow's Market	64
Use Simplified Method to Make Oval to Round Fitting	69
Survey Reveals Big Market for Zone Controls	72
Wholesalers Study Dealers' Needs	74
Educational Folder Helps Prospects Decide on Cooling	82
Rule of Reason Governs Employment Contracts	80

SPECIAL OFFER

Use Artisan's Seller-	-Owner-1	User Certificate	
To Tell Prospects	You Know	Air Conditioning	 44

DEPARTMENTS

The Editor's Notebook	6
What's Happening — Including Washington Letter	23
Editorial: No Gimmicks Needed	39
Hugh Reid's Pattern Problem	69
Idea Exchange for Dealers and Contractors	82
You and the Law	86
What the Associations Are Doing	90
Equipment Developments	116
New Literature	158
We Hear That	164
Wholesaler Doings	168
Merchandising Ideas	172
Appointments	174
Index to Advertisers	180

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RESIDENTIAL AIR CONDITIONING WARM AIR HEATING SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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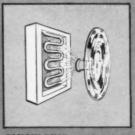


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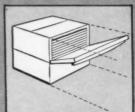
Condensate made a benefit with new Mueller Climatrol 915 cooling unit





"GOLDEN BELL" vaporizes water onto condenser coil, providing up to 20% more efficiency and reducing operating costs.





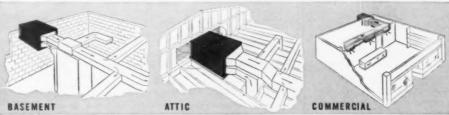
HUMIDITY COLLECTOR keeps moisture from being blown back into bome, prevents water from entering ducts.

Here's a welcome change and advance from the "me too" engineering of other makes of self-contained waterless air conditioners. The Type 915 is Mueller-designed through and through—and shows it! Look how condensate is put to work to increase efficiency —prevented from entering the ducts to cause cracking of plaster and damage to woodwork.

But that feature only headlines a lot more big news. Exclusive CLIMASTAT† gives automatic protection against freeze-up... the 915 has 13% more condenser face area than the average unit... a custom-engineered pre-fab duct kit — and plenty more. It's a completely preassembled package, available in 19,500 Btu and 38,150 Btu sizes with twin cooling cycles in the larger unit.

Trademark

Takes on more cooling jobs than any other type of unit



You're in a prime spot for profit when you handle the new Mueller Climatrol Type 915. Adaptable to any home and many commercial jobs, its uncomplicated installation makes cost-saving sense for both new and existing buildings. In fact, look for this type of unit to win a healthy 40% share of the entire cooling market by next year.

the editor's notebook

Thumbing Through This Month's Artisan

. . . we are warned by S. W. Reid, in his series on cooling problems, Don't Take Blower Motor for Granted. We are reminded that because the blower motor in a cooling system is noted for its dependable service year in and year out, this vital component is often overlooked in regular maintenance of the cooling system, although it can be a source for complaints if rules governing its application are violated. The author explains, through diagrams and explanations of electrical currents, just how the blower operates, what can be done with it, what to do if it fails and how to determine the loads it can handle.

Plastics

... and we learn. in a vicarious visit to the Sheet Metal and Air Conditioning Contractors National Association convention in Chicago May 15-18, that sheet metal contractors have a golden opportunity to get on the industrial construction bandwagon by adjusting their operations to include the use of plastics for certain installations. In the convention report, SMACNA Sees Bright Future for Sheet Metal Contractors, we hear men who are key figures in the expansion of the sheet metal industry discuss such subjects as demand for and cost of plastics, welding procedures, service policies, advantages of codes and licensing, fire protection standards, insurance, advisability of establishing a separate national association for heating and cooling dealers, and apprenticeship problems. We also meet

Problem: Return Air Application Solution: A-J No. 42 SERIES GRILLES and REGISTERS

MAXIMUM PERFORMANCE WITH MINIMUM

SEE-THROUGH

Now - you can get

masterfully engineered

return air control

and effective dust con-



No. 42-H Grille



No. 432-V Register



No. 442-H Volume Control Register

cealment. This marvelous combination is made possible by the new A-J No. 42 Series Grilles and Registers!

Here's the secret: A-J has placed the face bars on $\frac{1}{2}$ " centers with a 45° deflection. This provides unhampered air flow and at the same time minimizes see-through. The face bars (20 gauge cold-rolled steel) are available in both horizontal and vertical styles, depending on individual use and preference.

The No. 42 grille is available with a multiple valve register body (No. 432-V or H). An added advantage is a control handle which can be either removed after the system is in balance to discourage tampering with the valve setting, or left in place to adjust when required.

If you like, you can also get the No. 42 grille with a vertical opposed blade damper (No. 442-V or H). The damper is the A-J No. 44 damper, and is adjustable through the face of the grille with a No. 2 or 3 Phillips Screw Driver.

The frame enclosing the grille core is the proven wraparound frame as furnished in other A-J air conditioning registers and grilles as well as in the no-vision series. The rims are ½" beyond duct size on all sides. Rims have counter-sunk screw holes and No. 8 sheet metal screws, plated, are furnished. Gasket is furnished on No. 432 and No. 442 styles. Standard finish is gray prime. It is also possible to order all-aluminum models.

For complete information on the No. 42 Series, as well as on other famous A-J products, write now for your copy of the A-J catalog. It contains over 1,000 types and sizes of A-J grilles, registers, etc.

A-J Manufacturing Co.

3601 East 18th St.

Dept. A-6

Kansas City, Mo.

the editor's

(continued)

the new slate of officers, headed by President Nat N. Leas.

Intake

... we solve a problem brought about by the current practice of making homes as air tight as possible, by learning Why, Where and How To Install an Outside Air Intake to provide combustion air, odor control and moisture control. Author Frederick B Morse describes how outdoor air can be introduced, where to install the intake duct and what benefits can be expected from the addition of the proper amount of outside air. A number of illustrations of actual installations made by different heating dealers under various conditions bear out the author's contention that the best intake is the most convenient one and that there are any number of places where outside air can be collected without detracting from the appearance of the property.

Promotion

. . . and we see how Two Keys Unlock Doors to Big Volume Business, in a case history of a thirty-yearold heating and cooling business which has proved that a well trained organization plus a continuous promotion program can add up to a million dollar sales volume. We observe that consistent newspaper, magazine and direct mail advertising, specialized selling, departmentalized operations, a selling service department and a streamlined bookkeeping system combine to build a big business which does a tremendous volume of work in the



With the Auto-Guide, you merely turn up a starting flange, start the material in the machine AND LET GO! The Auto-Guide will follow inner or outer radii, irregular edges, straight edges or any edge—
automatically. One model attaches to either your Lockformer 20 or 22;
another model fits the Lockformer 24. A special power unit is now available which makes the attachment a complete self-powered flanger—a floor stand takes it off the bench.



Want more facts? Write us for Bulletin A. To eliminate spoilage, to turn out perfect flanges—faster and cheaper—just say the magic words, "Lockformer Auto-Guide" to your Wholesaler.

THE LOCKFORMER CO.

4615 WEST ROOSEVELT ROAD CHICAGO 50, ILLINOIS

the editor's notebook

(continued)

new house and modernization market as well as commercial and industrial fields, employs one third of all San Diego's sheet metal workers, installs at least 300 project systems each month, keeps 40 trucks busy, and has doubled in size in three years.

'Pictorial Inventory' **Good System for Dealers**

I HAVE always favored the use of colored forms in a business operation, and in checking with dealers purchasing from Mueller Climatrol I find they like the idea too. Perhaps you can develop a system of your own from the practice they use to simplify stock keeping.

The system is quite easy to understand. Special colors are used on each type of inventory form, providing quick - glance identification. Red means that the carton contains the parts for a gas installation. Blue indicates parts for an oil installation. Yellow inventory sheets mean the carton contains a blower assembly. These inventory sheets are glued to the "outside end" of the carton for easy recognition.

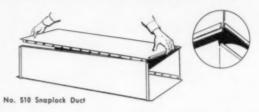
This color system has been used before. But the new twist that's gaining approval is the use of pictures of each part, providing a pictorial inventory to go along with the conventional coded parts listing. Both are printed on the same sheet, the photo montage at the left, the regular inventory form on the right.

Dealer Home Cooling Proves Popular Idea

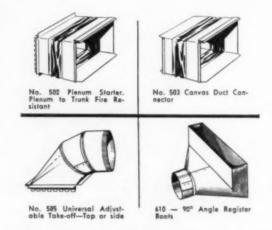
THE HIGHEST compliment a business magazine can receive is to have another publication recognize the worth



PRECISION-MADE FITTINGS INSURE A SNUG, PERFECT FIT EVERY TIME.



Rectangular Duct—Snaplock assembly with snaplock "S" clip and drive clips give quick, positive installations.



Strong, rigid CHAMPION fittings are machine fabricated - pipe, elbows, ducts and fittings are completely standardized. Special, sturdy cartons and sound packing provide extra protection for fittings . . . save time and storage space . . . speed shipments. Carried in stock by leading wholesalers.



CHAMPION FURNACE PIPE COMPANY

211 Eaton Street

Peoria, Illinois

the editor's notebook

of one of its ideas. This honor was accorded American Artisan in the March issue of Koldfax, the house organ of the Air-Conditioning and Refrigeration Institute. The bulletin printed verbatim the editorial which appeared in the February Artisan titled "Do You Know What You're Talking About?" We suggested that dealers, their salesmen and other employees would reflect more positively the advantages of summer air conditioning if they themselves lived in an air conditioned building. We thought it was a good idea and the large volume of mail we received requesting extra copies of the editorial indicates that many other people in the industry think so too.

Industry Passing Up **Good Cooling Bets?**

LACK OF aggressive salesmanship, in seeking potential customers or promoting sales through more impersonal direct mail contacts, may account in large part for the small number of central air conditioning units now installed in homes, a recent Du Pont survey indicated. Ninety-three percent of about a thousand owners of homes not now air conditioned in metropolitan areas throughout the nation said they have never been contacted by an air conditioning salesman. Of those not contacted, 26 percent said they have seriously considered some sort of cooling relief for their homes, and about half of them are potential sales targets for window air conditioners while slightly more than a quarter of them are prime prospects for central air conditioning.

The survey indicated an immediate market for at





All operating parts and complete factory wiring on one panel, quickly removed . . . shielded from heat.

Just released after four years of exhaustive laboratory and field testing, this new power inshot gas burner is really a three-way surprise: First, here's a gas burner by this famous maker of oil burners. Second, its neat, compact design is just what the industry has been asking for. Third, its smooth operational and service features are as revolutionary as those found

in Nu-Way oil burners. Quiet, too. Input rate 80,000 to 200,000 BTU per hour. Send immediately for "Model G-200 Manual," plus data on our salesdistribution policy. Write Nu-Way Corporation, Rock Island, Illinois.



Adjustable primary air gate. Quick on-the-job correction for differences in heating plant firing characteristics.



the editor's notebook

(continued)

least 270,000 central residential air conditioning systems in metropolitan areas alone. Representing a retail market potential of at least a quarter of a billion dollars, that market, if realized, would more than double the number of homes now cooled by central refrigerated systems.

The study also indicated that 43 percent of existing central residential air conditioning units are installed in homes valued at upwards of \$30,000. Homes in the \$20,000 to \$30,000 range account for 25 percent of the installations with 21 percent in \$15,000 to \$20,000 homes, 10 percent in \$10,-000 to \$15,000 homes, and one percent of the installations in the \$7500 to \$10,-000 class. More than nine out of 10 homes now centrally cooled have forced warm air heating systems.

Home owners with annual incomes in excess of \$10,000 account for 58 percent of existing installations, while 26 percent of the installations are in homes owned by people in the \$7000 to \$10,000 a year salary bracket. The remaining 16 percent are owned by people in the \$3000 to \$7000 annual salary group.

Here are the facts that will help you direct your sales promotion toward the best prospects. Let's make the best year yet — both saleswise and profitwise.

40,000 Attend World's Biggest Sales Meeting

THE SMALL business man, the merchant and the door to door salesman — all key figures in the distribution picture of our nation's economy — all get a chance to learn how the country's "super" salesmen do it when



"DUCTAPE Installation Saves 80% of Labor Cost!"

That's what Glenn Cooper, General Manager of Place and Company, South Bend, Indiana says. Here is his statement: "For years we used various materials for our heating and air conditioning ductwork. The old methods were time consuming. We had to wait 6 to 8 hours for the grouting to set. The joints weren't moisture-proof and they often disturbed air flow through the ducts.

"When we began to use Arno Ductape we could seal sections of cement and asbestos pipe with one quick wrapping of Ductape—with an amazing 80% labor savings! The seal is permanent, smooth and moisture-proof!"

Find out for yourself. The coupon brings you a free sample.





ADHESIVE TAPES, INC.

Sales Offices
Atlanta — 1272 Westridge Rd. S.W.
Detroit — 12915 W. Eight Mile Rd.
Fort Worth — 2724 Tillar Street
Los Angeles — 3225 East 46th Street
New York — 104 West 17th Street

ARNO ADHESIVE TAPES, INC.

Subsidiary of The Scholl Mfg. Co., Inc.
4110 Ohio Street, Michigan City, Indiana

Please send me a free 15-ft. sample flame-resistant

I am a Distributor

Contractor

Name	
Company	
Address	
City	State

the editor's notebook

(continued)

"Tele-Sell" stages its periodic sales meetings. It is estimated that 40,000 salesminded persons attend each of the world's biggest sales meetings.

"Tele-Sell" is a cooperative educational venture being staged by 34 local sales executive clubs and chambers of commerce and is shown by closed circuit television to 34 American and Canadian cities. The programs, featuring actual demonstrations rather than speeches, cover two themes: 1) how the salesman should handle himself, and 2) how the salesman should handle his customer. Each program runs two hours and features live dramatizations with professional actors on the "do's and don'ts of selling." Film techniques of selling as they apply to various industries also are to be shown.

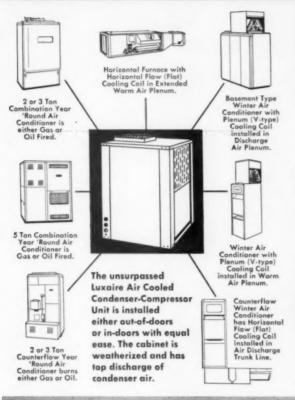
Tickets for admission can be obtained from local sales executive clubs and chambers of commerce members in the following cities:

Baltimore, Boston, Buffalo, Charlotte, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Dayton, Detroit, Erie, Ft. Lauderdale, Indianapolis, Jacksonville, Kansas City, Miami, Milwaukee, Minneapolis, Montreal, New York, Newark, Oklahoma City, Omaha, Philadelphia, Pittsburgh, Providence, Rochester, St. Louis, Syracuse, Toledo, Washington, Wichita and Wilmington.

Top Jobs Plentiful; Exec Talent Lacking

TOP LEVEL management jobs are more plentiful than ever before in today's expanding industry but good men to fill them are even harder to find than they were in the already tight job market of five years ago. Business con-

WITH AIR CONDITIONING



You have OUTSTANDING Design and Construction that is Lower in Price PLUS ...

Extra FLEXIBILITY in Air Cooled Installations

As shown at left, a single 2, 3 or 5 Ton Luxaire Air Cooled Condenser-Compressor Unit can be used for any of the Year 'Round Air Conditioning applications illustrated - with the Luxaire Combination Heating and Cooling Unit, or added to any type of Forced Warm Air Furnace. Installation is easy and uncomplicated, consisting of connecting the Condenser-Compressor Unit to one of the Luxaire Cooling Coils illustrated below.



Furnace-type Cooling Coil is readily installed in the 2, 3 or 5 Ton Year 'Round Air Conditioner, or in the unique 2 or 3 Ton Counterflow Unit.



2 3 or 5 Ton Plenum type (V) Cooling Coil for installation in the Warm Air Plenum of Unflow Furnace.



2, 3 or 5 Ton 2, 3 or 5 Ton
Horizontal Flow (Flat)
Cooling Coil for
installation in Air
Discharge Trunk of
Forced Air Furnace.

VERSATILITY WITH WATER COOLED UNITS

The compact, efficient 2, 3 or 5 Ton Luxaire Water Cooled Refrigeration Circuit is a complete unit. charged with Freon and sealed at the factory. It slides completely within the cabinet of the Luxaire Combination Year 'Round Air Conditioner, or is housed in its own separate cabinet for 3 or 5 Ton Add-On installations.



Luxaire Water Cooled



Water Cooled Refrigeration Circuit as installed in Luxaire Combination Year 'Round Air Conditioner.



Water Cooled Add-On Unit as installed with Winter Air Conditioning Unit.

EXTRA QUALITY AT NO EXTRA COST

Luxaire Cooling Units are durably built, with no troublesome gadgets, for extra years of service.

Compressors are heavily constructed and are readily serviceable in the field. The complete cooling circuit is warranted under one of the most liberal Five Year Protection Plans in the industry.

You pay no premium for this excellence. In fact, you pay less, because of Luxaire's advanced design and construction.

If you want to be really competitive in cooling, while installing a superior Cooling Unit, see your Luxaire jobber now!

OLSEN MANUFACTURING COMPANY . . ELYRIA, OHIO HEATING & AIR CONDITIONING UNITS

the editor's notebook

(continued)

tacts are the most productive source for recruiting executive talent, according to a decisive majority of respondents to a survey conducted by the American Management Association. Other sources are personal recommendations, advertising, consulting firms, and commercial employment agencies. Unsolicited applications are last, though a few companies find them the best source.

Close to half the firms surveyed have or are developing routine procedures for handling candidates. For these jobs there are seldom fewer than two interviews and much more frequently there are four or five applicants seriously considering each position.

Interest High in SBA **Management Courses**

THE GROWING interest shown by small business operators in learning more about new management techniques is most gratifying to me. I was very pleased to receive a report from the Small Business Administration on the success of the schools being held under its administration and in co-sponsorship with educational institutions. The report states:

"Conducting a small business today involves many problems, a number of which the businessman-student can hope to solve with information acquired from such a course of practical management.

"Experience has shown that many small business owners and managers lack a well-rounded management background. For this reason the courses deal with administrative management rather than day-to-day operations, and are consequently designed for owners and man-

LET THE SPECIALIST FROM NATIONAL LOCK HELP SOLVE YOUR HARDWARE AND FASTENER **PROBLEMS**

The National Lock sales engineer is fully qualified to recommend the "best" hardware for your product line ... best in decorative styling ... best in functional design ... best in quality components. If your requirements call for custom-built hardware. our specialists will work with your designers in creating smart, modern hardware ... engineered to cost you less. Write us for full information on how we can be of service to you.

all from 1 source

- CATCHES
- CONTINUOUS HINGES
- LATCHES HANDLES

- KNOBS
- CABINET LOCKS
- · PULLS

- PLASTICS
- REGULAR AND SPECIAL FASTENERS



NATIONAL LOCK COMPANY Rockford . Illinois Industrial Hardware Division

the editor's notebook

(continued)

agers. Small tuition fees, paid by the students, defray the costs of the management

"Universities, colleges and distributive education centers participating in the co-sponsored courses in less than three years now crisscross the nation from Texas to Massachusetts and Washington to Florida. At this rate of growth the time may soon be at hand when all energetic and determined small business proprietors can spend their time in the profitable study of their administrative management problems and with considerably less traveling."

Customer Meets Seller At Industry Shows

TRADE SHOWS such as the International Heating & Air-Conditioning Exposition held in February at Chicago's International Amphitheatre have become an integral part of our way of doing business. They are now probably as important a way for customer to meet seller as other familiar tools - advertising. direct mail or market research. You can't help reaching that conclusion in observing how the most successful companies in history operate.

While historians can trace the origin of trade shows back to the colorful bazaars of antiquity, the real impetus for their growth has come since World War II.

Heating and ventilating engineers attending trade shows find them the best possible method of evaluating product lines for their market.

Clyde M. Barner



VERSATILE NEW RHEEMGLAS FURNACE

priced right to capture the big-profit replacement market!

Out with the old, space-eating octopus—in with a new Rheemglas furnace. A furnace offering so much that's new, so many advantages, you'd just expect it to cost more than comparable units. But it doesn't!

Rheemglas makes it far easier to add on summer air conditioning. It comes with an optional plenum and is specially engineered for cooling. Rheemglas is built to last longer than ordinary furnaces. The combustion chamber is lined with Rheemglas—a very special glass lining that eliminates rust and corrosion—and is unconditionally guaranteed for 10 full years!

Rheemglas is smaller. That 80,000 BTU gas-fired model shown above takes less than 3 square feet of floor space. It's a beauty too, isn't it? Handsome two-tone styling. Slim and trim. Not a button or knob showing. It's going to be installed as a highboy, but it could just as easily be a lowboy with one simple returnair attachment.

Equally important, Rheemglas is not one of a kind. Rheem has more new furnaces like it. There's a whole new Rheem heating line of gas- and oil-fired highboys, lowboys, horizontals and counterflows. Contact your distributor for details.

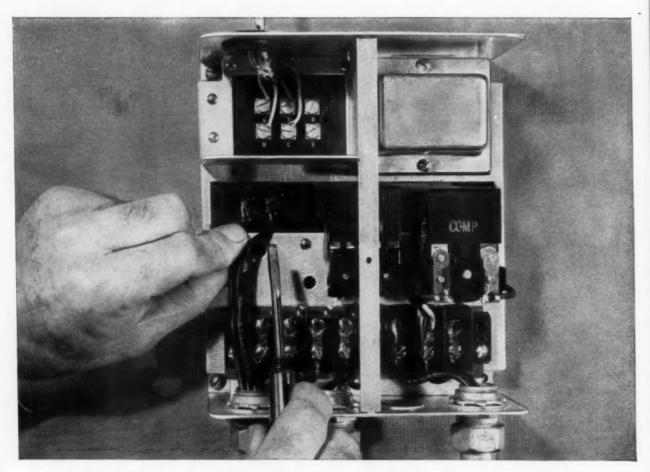
YOU CAN RELY ON



THE BIG NAME IN COMFORT PRODUCTS FOR THE HOME central air-conditioning systems, wet-heat boilers, water heaters, water softeners, plumbing fixtures

Home Products Division of Rheem Mfg. Co. / 7600 S. Kedzie Ave., Chicago 29, Illinois

It's easier-and more



A complete cooling control panel for self-contained air conditioners, the W402G (above) has these quality features: 24 volt transformer, heavy duty compressor relay, color coded thermostat terminals, line and load terminals, pressure control terminals and evaporator fan relay. The cover is an easilyremovable, wrap-around type which affords convenient accessibility for quick and easy wiring.

All W402 Panels have these outstanding features:

- Complete circuitry allows you to "customize" your particular installation.
- Designed to contain three relays which may be contactor, fan relay and heating relay, or different combinations of these relays.
- **3.** Remote Control. Fan relay permits selection of fan operations from the thermostat.
- 4. Available with unmounted Hi-Lo Pressure Control.
- 5. Small-7\%" high, 6\%" wide, 3\%" deep.

profitable to offer the best

Honeywell <u>Custom</u> Air Conditioning Control with famous W402 Panels

It's EASIER to offer Honeywell Custom Air Conditioning Control because you don't have to go through time-consuming, on-the-spot wiring of internal circuits. Honeywell control panels like the famous W402 series have exclusive Simplified Wiring which permits factory wiring of the heating-cooling circuit. Their compact size and "wrap-around" cover make installation easy and quick.

And Honeywell Custom Air Conditioning Control is more profitable, too. No other panels offer so many outstanding features at such low prices. You also save in service costs because Honeywell's time-tested components guarantee years of trouble-free performance.

All Honeywell panels are designed to work with the famous line of Honeywell heating-cooling thermostats. For full information on the complete line of Honeywell Control Panels for air conditioning, call your local Honeywell office or write to Honeywell, Dept. AA-6-179, Minneapolis 8, Minnesota.

Whatever your control needs on 2 h.p. units, there's a Honeywell

W402 panel to meet them-more profitably-more dependably

W402G—A complete Control panel for self-contained 2 h.p. air conditioners. Provides compressor control and fan selection. Compressor Relay is double pole, single throw rated at 16 amps per pole. Can be wired for single pole, single throw rating of 22 amps. **W402B**—A control panel specially designed for reverse cycle heat pumps of self-contained variety.

W402F—Most compact panel on the market—for two-stage cooling. Offers 2-stage cooling with self-contained air conditioners which employ two 1¾ h.p. compressors and a fan relay for fan selection.

Other Models available with remote reset relays, heating relays and special sequencing operations.

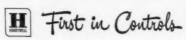
All contain Honeywell time-tested components.

*Trademark

Honeywell



Honeywell Round, T-87 world's most popular beating-cooling thermostat.





Which is the best way to heat a house?

That depends on the house. The size, the construction, the kind of architecture make big differences. And there's another important point. Is air conditioning to be added later? Whatever the heating or air conditioning need, a Carrier dealer has the equipment to meet it. (Four of the many choices a Carrier dealer can offer his prospects are shown at the right.) Furthermore Carrier dealers are the best trained heating and air conditioning specialists in the business. Would you like to join the ranks of prospering Carrier dealers? Call the nearest Carrier distributor or write to Carrier Corporation.

It's time to call Carrier. You'll find your Carrier distributor's name in the Classified Telephone Directory. Carrier Corporation, Syracuse, New York.



For homes with busements—A Carrier Winter Weathermaker* occupies less space than conventional furnaces. It's a "Furnace with a Future" because cooling is easily added later. Repeat business for you.



For homes without basements—A downflow Carrier Winter Weathermaker is ideal for homes with slab or crawl space foundations. Cooling coil can be quickly inserted under furnace. Repeat business for you.



For small compact houses—This horizontal Carrier Winter Weathermaker occupies no living space. It may be located in the attic or the crawl space. Cooling coil can be built into the ductwork. Repeat business for you.



For large houses—The Carrier oil-fired lowboy Winter Weathermaker was designed for demanding heating jobs. Cabinet on top makes the addition of cooling coils simple. More repeat business for you.

Fabulous Gulfgate



Owner: THEODORE W. BERENSON AND ASSOCIATES, Boston, Mass.; Architects-Engineers: JOHN GRAHAM AND COMPANY, Seattle and New York; Associate Architects: IRVING R. KLEIN AND ASSOCIATES, Houston; Contractors-Engineers: FARNSWORTH & CHAMBERS CO., INC., Houston; Sheet Metal & Roofing Contractor: LYDICK ROOFING COMPANY OF HOUSTON, Houston; Revere Distributor: MONCRIEF-LENDIR MANUFACTURING COMPANY, Houston.



HERE YOU SEE workman putting the Revere-Keystone standard 4" flat copper receiver with ¼" hook dam in place preparatory to putting masonry in place. Revere-Keystone 2-Piece Cap Flashing also comes in combination receiver and Thru-Wall Flashing, with receiver furnished in 49" lengths (48" layup), with 1" overlap in a locking tongue dam to assure proper alignment. (See diagram on next page.)



MASONRY being put in place over the Revere-Keystone 2-Piece Cap Flashing. In this way masons and roofers can work without interference and without damaging cap which is snapped into place after work is completed.

Shopping Center

takes 3 fast steps to a tight-as-a-drum Flashing Installation...uses

REVERE-KEYSTONE*

2-PIECE CAP FLASHING

This Shopping Center, located in Houston, Texas is the largest regional Shopping Center in the South, and includes famed Joske's and Sakowitz Department Stores. The Center itself, including buildings, truck tunnels and malls covers about 840,000 square feet, with the entire plot covering 2,580,000 sq. ft. which has in excess of 5,000 prime car parking spaces. It represents a \$32,000,000 investment and was designed by JOHN GRAHAM & Co., of Seattle and New York.

Although there are 15,000 lbs. of Revere Sheet Copper and 8,600 ft. of Revere Reglet Flashing on this job the item of greatest interest is the 1,000 ft. of Revere-Keystone 2-Piece Cap Flashing, the flashing system that has created quite a stir with architects, sheet metal contractors and engineers.

HERE ARE SOME OF THE REASONS WHY-

FREE WALL—It provides the roofer with an unobstructed wall face for the placement of the base flashing. Receiver is laid in during construction of wall, while the insert is snapped in only after all roof and base flashing work is finished.

STRAIGHT CLEAN LINE, PERMANENT GOOD LOOKS—Factory-bent to precise dimensions. This, with the one-inch locking tongue, assures alignment of receiver slots, uniform appearance.

PERFECT WEATHER-SEAL—Factory-formed angles on the receiver and insert cause latter to hug the base flashing, weather-seal effectively. Water cannot blow up behind flashing.

NON-LEAKING DAMLOCK — Requires no soldering except for special conditions. The interlocking copper-to-copper overlap

creates a dam which prevents longitudinal travel of water and drains seepage to the face of the wall.

VERTICAL RECEIVER SLOT ON WALL FACE—Position of vertical receiver slot on face of wall eliminates possibility of the receiver slot being crushed shut by weight of masonry.

CAN BE DISASSEMBLED—Insert can be removed with a simple tool and used again, with no loss of neatness or snugness, when the built-up base flashing or roofing have to be repaired.

Find out about this newest method of flashing neatly, quickly, safely, positively. Send for descriptive literature today! Write Advertising Department.

FREE For group showing—Instructive 16 mm motion picture in sound and color—"SHEET METAL IN BUILDING CONSTRUCTION." A "must" for every Architect, Building Owner, Spec. Writer, Sheet Metal Contractor and Mechanic. Write Revere Advertising Department.

*Patent No. 2,641,203 Other Pats. Pending

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

Mills: Rome, N.Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N.Y.; Newport, Ark.; Ft. Calbonn, Neb. Sales Offices in Principal Cities, Distributors Everywbere.



SNAPPING CAP MEMBER INTO PLACE to form a perfect weather seal gives the job a nice, neat finish. And should built-up base flashing or roof need repairing, the insert or cap can be removed with a simple tool and used again without loss of neathers or original snug fit.



"SELL AIR CONDITIONERS TO ESKIMOS? HOW D'YA DO IT, J. P. ?" "EASY, SAM ARMSTRONG FEATURES **CONVINCE ANYONE!"** Sam. Don't have many prospects up here, 'course, but it just goes to show you . . . anybody's liable to buy when you can show 'em features like these.



- EXTRA-LARGE "6-IN-1" COOLING COIL six separate coils in one unit! Big coil surface gives full capacity cooling without strain.
- THERMOSTATIC EXPANSION VALVE full Freon charge evenly distributed through 6 injector tubes. Out performs any other kind of unit by a mile, Sam!
- HEAVY-DUTY CONDENSING UNIT "whisper quiet", softest soundin' unit made, Sam. Extra-large condenser with Freon reservoir makes quicker, more complete cooling, and the condenser is in a beautiful durable aluminized steel cabinet, installed remotely... that's away from the coil, Sam.
- ARMSTRONG HAS A COMPLETE LINE, TOO, SAM. Up-flow, down-flow and horizontal-flow coils with companion units. Then there's the neat, new FRIGIPAK model... so compact and flexible... most versatile air conditioner ever madel And that terrific new line of Armstrong commercial space coolers, too, Sam all the way from 3 to 15 tons!
- THEY'RE A SNAP TO INSTALL, SAM. I'm tellin' you this Armstrong line's really
 the heatin' man's line.
 Easy to put in, easy to maintain. No fancy tricks, just a darn good unit . . . the best, Sam!

"So you see Sam, an Armstrong dealer doesn't have to work himself into a lather, because top quality Armstrong practically sells itself . . . from Nome* to Rome. Armstrong features can't be beat, and you won't need a sled like this to carry your inventory on, either . . . your Armstrong wholesaler does that for you."



"BY GOLLY, J. P., this Armstrong really sounds great . . . how do I find out more about it?"

"Just call your nearby Armstrong wholesaler, Sam, he'll be more than happy to fill you in on the details. And do it right now . . . today!"

*"That's in Alaska, Sam".

Just look at these wonderful Armstrong selling tools, too!

"SALESMASTER" SOUND FILM-STRIP 10 minute light, bright and selling story of Armstrong Air Conditioning.

- AIR CONDITIONING "VISUALIZER" terrific, hard-selling book of pictures that gets right down to
- the nuts and bolts of an Armstrong Air Conditioner.

 RADIO AND TELEVISION SCRIPTS that sell, sell, sell the convenience of Armstrong Air Conditioning.
- NEWSPAPER ADVERTISING MATS real eyecatchers that sell you and Armstrong.
- BANNERS to dress up your store . . . let people know you're in business.
- DECALS act as continuous, silent salesmen for you wherever you see them.
- DIRECT MAIL a series of clever, colorful mailing pieces for your homeowner or business prospects.
- NATIONAL ADVERTISING sells the name of Armstrong and its quality . . . builds prestige for you.

And, Armstrong has been selected by the editors of "Show House" — modern living feature of "Saturday Evening Post" and "Living for Young Homemakers" — to participate in this year's "Show House" promotion. It's a big, colorful, 2-page blast on ideal living in the finest surroundings, with Armstrong supplying the climate! Watch for it!



ready to assist you . . . all-ways

Building addition to home = Wants summer air conditioning Wants to modernize heating plant Converting to forced air Should have louver ventilators omitted gutter

Profitable jobs are all around you!

Modernization, remodeling, and repair add up to real business...17-billion dollars' worth!

Yes, that's right—17 billion! The figure is based on reliable estimates. That's how much will be spent in 1957 for improvements of all types: modernizing old residences, making small homes bigger, rehabilitating blighted areas, improving commercial and industrial buildings.

Prospective jobs are everywhere—many right in your own backyard—rain-carrying jobs, heating jobs, ventilating jobs—jobs you can do fast and profitably with Milcor steel products.

Get your share of this \$17 billion market! Plan an aggressive sales program — make use of local advertising, direct mail and house-to-house canvassing. You'll find plenty of prospects,

And, remember—you can stake your reputation on a Milcor installation. Call our jobber for prices, or write the nearest branch listed below.



Complete line of furnace pipe and fittings.



Complete line of roofdrainage equipment.



Complete line of louver ventilators.



SHEET METAL PRODUCTS

INLAND STEEL PRODUCTS COMPANY, Dept. R. 4023 West Burnham Street . Milwaukee 1, Wisconsin

ATLANTA-BALTIMORE-BUFFALO-CHICAGO-CINCINNATI-CLEVELAND-DALLAS-DENVER-DETROIT-KANSAS CITY-LOS ANGELES-MILWAUKEE-MINNEAPOLIS-NEW ORLEANS-NEW YORK-ST, LOUIS,

Offers Cash Awards For Design of Home With Solar Heating

PHOENIX, ARIZ. — An international architectural competition to obtain designs for a solar-heated residence, particularly adapted to the arid Southwest, is being held by the Association for Applied Solar Energy.

Jan Oostermeyer, president of the association, said that \$2500 and a contract to supply architectural services for the actual building of the winning design are offered as first prize. Awards of \$1500, \$750 and \$500 will be made to the runners-up.

The competition, open to practicing architects, designers, and students throughout the world, will close on August 15, 1957.

The ideas developed through the competition may well represent part of the heating systems of tomorrow.

The top design will be incorporated into a residence to be built in the Paradise Valley area northeast of Phoenix. Exhibition of the residence will be one of the features of National Home Week for 1958, to be sponsored by the Phoenix Association of Home Builders. The prize winning home will also be the focal point of a Solar House Symposium to be held in Phoenix late in 1958.

Hundreds Attend Eastern Apprenticeship Meeting

YORK HARBOR, ME. — More than 600 representatives of management, labor, education and government attended the 13th annual Eastern Seaboard Apprenticeship Conference held here June 5-7.

Panel discussions on apprenticeship in the building and construction trades, as well as other industries, were led by management and labor leaders.

The meeting was arranged by the Maine Apprenticeship Council and the U. S. Department of Labor.

Home Building Looks Brighter As Congress Passes Aid Bills

Washington, D.C. — April figures on new house starts indicated a slight recovery over the previous downward trend. At the same time, industry leaders were optimistic that the tight money market was passing. The two houses of Congress further bolstered the hopes of home builders by passing separate bills packed with provisions designed to stimulate the industry.

As was to be expected, housing starts in April rose seasonally to 92, 000 public and private units. This was an increase of 11 percent over March, but still well below the 111, 400 units for the same month last

Permanent Program Considered for ohi

NEW YORK CITY — The board of directors of Operation Home Improvement has polled the industry to determine whether a permanent home improvement organization should be created to carry out the objectives of the ohi campaign.

In a letter to leaders in the industry, Paul B. Shoemaker, ohi chairman, said, "Those of us who have been close to ohi are convinced that the program has a very positive effect on sales. And we feel very strongly that a permanent activity will help us all."

The announced termination date of the ohi campaign is July 1, 1957. The organization was originally formed as a one year promotion effort and was later extended a second year.

Industry members are being asked to consider a new name for the program. Some have found the program's initials too similar to those of the Oil-Heat Institute. They are also being asked how the permanent organization should be formed and what services it should provide.

year. It was also the smallest total for April since 1949. However, when April figures are projected on a seasonally adjusted basis, the annual rate during the month rose to 940,000 units as compared with 880,000 in March. This was the first upturn in the annual rate since last October.

J. Stanley Baughman, president of the Federal National Mortgage Association, predicted "an easing" in the market for residential mortgage money. "An analysis of FNMA's purchases for the past year seems to indicate that the fourth quarter of 1956 was the peak of the tight market for mortgage money," he said.

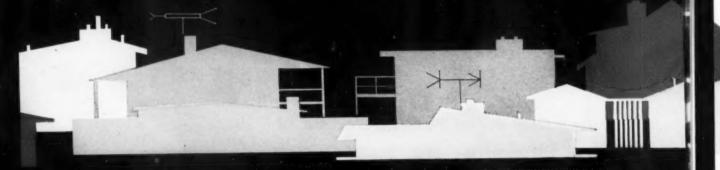
A better supply of mortgage money for homes in the coming months was also seen by Norman P. Mason, commissioner of the Federal Housing Administration. He pointed to the opening up of new sources of mortgage funds, such as pension trusts and union welfare funds, which are beginning to show an interest in mortgage investments.

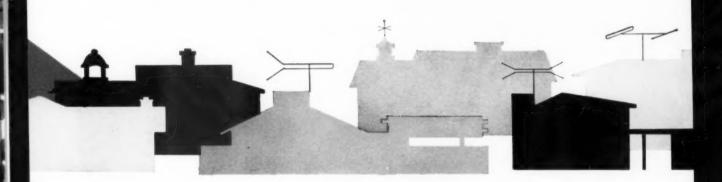
Adding to the signs of encouragement the House of Representatives passed a housing bill which is calculated to provide a boost to home construction. The measure increases the borrowing authority of FNMA by \$1.25 billion. This agency purchases mortgages and thus releases more funds for lenders to use in making new loans. The House bill also would make a significant cut in minimum down payment requirements under the FHA's mortgage insurance program, and gives federal housing officials control over discounts on government-backed mortgages.

The Senate in the meantime has given approval to its own housing bill with some different provisions. Since the Senate in effect turned down the House bill, final action will undoubtedly require extensive conferences to iron out differences.

(More news on page 27)

There's no such thing as an Average House





Only Westinghouse gives you "Just Right" Air Conditioning for each home!

It's a fact! Cooling requirements differ from house to house. Size, style, exposure, local climate, number of inhabitants—and more, all make a difference. You'll find that Westinghouse—the only "Really-New" Air Conditioning line—gives you the *one best* unit for each of your customers—wherever you sell.

While competitors try to satisfy all customers with but 3 remote condensing units (2, 3, and 5 HP), Westinghouse gives you 7! With Westinghouse there's no "too much or too little" cooling capacity . . . you can close each sale with cooling that's "Just Right" for the job. And you can do it with profit, because "Just Right" cooling means just right pricing!

That's not all! New Westinghouse units are air cooled; install easily out-of-doors . . . combine

with any forced warm air heating system (using the same ducts); deliver complete home air conditioned comfort—automatically. Finished in handsome beige and charcoal, they blend with any exterior decor. They're whisper quiet . . . exhaust air up and away from house . . . do not annoy neighbors or damage shrubs.

What's more, Westinghouse Dealers get fast delivery, sales training, technical aid, finance plans, local advertising, sales promotion—and more.

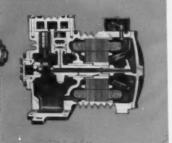
These are just a few of many reasons why a Westinghouse Franchise is valued as the "Franchise With The Future" by leading contractors and dealers across the nation. For complete details write: Westinghouse Air Conditioning Division, Dept. 2F, P. O. Box 510, Staunton, Virginia.

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Westinghouse
AIR CONDITIONING DIVISION STAUNTON, VIRGINIA

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COPELAMETIC

THE ACCESSIBLE HERMETIC

You can get to direct-drive Copelametic units effortlessly...in a jiffy. No belts or seals, no manual oiling. 90% of service costs eliminated. Models for all applications—air-cooled—from 1/3 through 5 H.P. Water-cooled 1/3 H.P. through 10 H.P.

the
easy
way
to solve
a tough
problem



high-quality installations in the air-conditioning and refrigeration fields.

And you have worries. You must meet and beat competition. The quality and performance of what you get from your suppliers are a constant concern.

That's the perfect time to make sure there's a Copeland motor-compressor or condensing unit in every piece of equipment you install. For Copeland units are masterfully designed, painstakingly built, are standard with leading manufacturers. Now they're streaming from our spankingnew plant—270,000 square feet of America's most modern manufacturing facilities.



MANUFACTURERS OF THE HEART

OF AMERICA'S FINEST AIR CONDITIONING AND COMMERCIAL REFRIGERATION UNITS

CORPORATION, Sidney, Ohio

SINCE 1918

Copeland

Installment Debt Up Moderately in 1956

CHICAGO — The American consumer borrowed \$39.6 billion last year, while making payments on previous debts which amounted to almost as much. This information was revealed in Federal Reserve Board statistics as released through the local office of the National Association of Manufacturers.

Repayments on credit loans totaled \$37.1 billion during 1956, the report stated. This left a total installment debt at the end of the year of \$31.5 billion compared with \$29 billion at the end of 1955.

The NAM report pointed out that the net increase of \$2.5 billion in the national installment debt last year was considerably below the \$5.5 billion increase reported in 1955.

Describes Typical FHA Mortgage Deal

WASHINGTON, D.C. - Norman P. Mason, federal housing commissioner, described the characteristics of the typical FHA mortgage transaction in 1956. "We serve people of all incomes," he said. The median annual income of those who financed the purchase of a new home last year with the proceeds of an FHA-insured mortgage is \$6054, according to the agency's figures. The incomes ranged from \$2500 to \$15,000 and up.

Mr. Mason said that the new homes purchased last year were larger and cost a little more than those purchased in preceeding years. Increasing costs of land acquisition and development were factors in the higher FHA valuations.

An insured mortgage of \$11,010, or 86.7 percent of value, financed the typical FHA home transaction. The average mortgage was made for a term of 25.5 years and called for monthly payments to principal, interest, insurance and taxes of \$81.70.

Conference Studies Profit Opportunity In Small Business

NEW YORK CITY - The second annual Small Business Conference, sponsored by the Society for the Advancement of Management in cooperation with the U.S. Small Business Administration, was held here May

The conference devoted considerable time to the discussion of the financial aspects of small business and better profits. A panel discussed "Getting More Sales at Better Profit." Group discussions were held on tax saving opportunities. A special session was devoted to "Getting Money When You Need It."

The problem of management development was also covered. A panel discussed "Building a Management Team." A presentation was made on "The Concept of Modern Management in Smaller Companies."

In addition, those attending were given the opportunity to consult privately with recognized specialists in various management areas.

Predicts 50 Percent Rise in Nickel Output

TORONTO, ONT. - A 50 percent increase in total free world nickel producing capacity by 1961 was predicted by Dr. John F. Thompson, chairman of the board, The International Nickel Company of Canada, Limited, at the firm's annual meeting held here. In five years, Dr. Thompson said the producing capacity will be about 650 million pounds.

Assuming that defense demand remains at its present level and there is no stockpiling, he said, the 1956 rate of world consumption will have to be increased by more than 75 percent to absorb this expanded output. It is evident that a huge new demand must be stimulated by developing new markets, he added.

Artisan Story Gets Publicity for Dealer

ERIE, PA.-When Trost Sheet Metal Works, Inc., was featured in an article in the January issue of American Artisan, Louis Trost recalled the advice he had read in an earlier issue. The Artisan's December edi-

Magazine **Features** Erie Plant

Trost Sheet Metal Pioneered in Use Of New Light Metal

The just published 1957 directory number of the national trade magazine, American Artisan, has for its featured article a several page story on Trost Sheet Metal Works, Inc., of Erie.

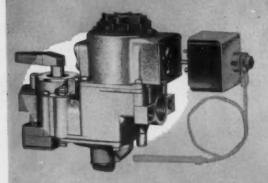
Once again, in this story of Trost Sheet Metal Works, we find another smaller Erie industry contributing in significant measure to the progress of an entire field.

torial had advised dealer-contractors to "Make News of Your Local Jobs."

Since the Artisan article on the Trost company told how it had pioneered in the fabrication of titanium, Mr. Trost thought it might be of interest to the local newspapers. He sent copies of the issue to the editors.

As a result, the Erie Times-News ran a feature story on the Artisan article (see above illustration). The story was 13 in. long and gave many details on the company's operations. The article was also mentioned in a column on business news.

(More news on page 30)



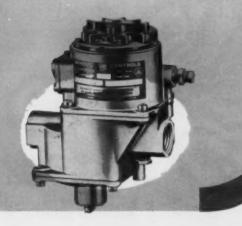
CHECK THESE SAVINGS

You get all the money saving advantages of the already famous combination controls that provide all necessary manifold functions of gas cock, regulator, gas valve and pilot valve in one compact control PLUS your choice of valve operators for complete flexibility in function and application.

Choose from General Controls' Self-Operated or 24 volt valve operators...diaphragm or solenoid type actions... add these combination controls profit advantages:

One order to write - One invoice to pay
One unit to receive - One unit to stock
One source, one responsibility
Pre-tested and assembled - Less wiring to run

A call to our nearest branch office will bring you the complete story of how you can have bigger profits by using the finest in gas control systems from the most trusted name in the industry.



MONEY-SAVING COMBINATION CONTROLS

AMERICA'S MOST COMPLETE LINE OF AUTOMATIC CONTROLS



B-60 The original and finest self-operated diaphragm valve operator, the B-60 Valve is low in cost and provides quiet automatic operation and straight line room temperature control of gas-fired furnaces, domestic boilers and other gas appliances.



B-50 For those who prefer the finest in 24 volt diaphragm valve operators the B-50 is the logical solution. Positive action and superior design, plus slow opening feature to "eliminate rollout" problems have earned for this unit an outstanding field reputation.

WITH
YOUR CHOICE
OF
VALVE
OPERATORS



K-3H If Solenoid Valve operation is your choice, the Super Silent, liquid filled, 24 volt K-3H valve operator is the answer. No vent line to pilot required and elimination of all moving parts from the gas stream mean extra long life and trouble-free operation for your units.

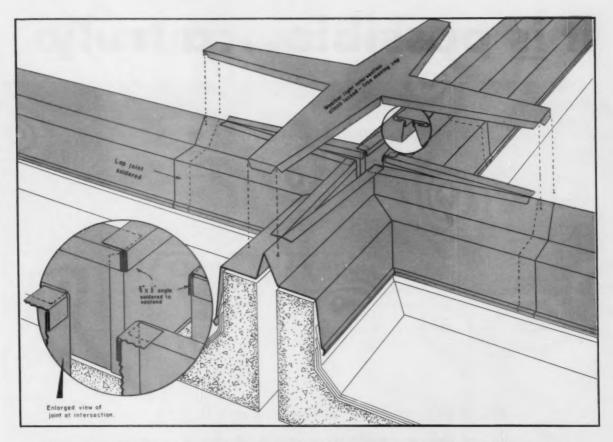


K-3A The standard of the industry for original cost economy, the high quality 24 volt K-3A Solenoid Valve operator is at its best in aiding you to meet particular market application problems. Engineered for dependability by the industry's largest manufacturer of solenoid valves.



GENERAL CONTROLS

America's Finest Automatic Controls for Home, Industry, and the Military
Glendale, California • Skokie, Illinois
Five Plants — 40 factory branch offices serving the United States and Canada



How to flash the intersection of structural expansion joints

Flashing the intersection of structural expansion joints requires a design that will permit freedom of movement during the expansion or contraction of the structure—and yet will provide a weatherproof covering at these intersections.

Cornice temper copper in 16-oz. or 20-oz. weight is recommended for expansion-joint flashing, and the drawing above suggests a method for flashing at intersections. Note that the flashing for each of the 4 expansion joints

is cut back on the center line of the expansion fold for a distance of about 18" to form a tapered opening. This break in the long, straight run of metal limits the effect of expansion and contraction on the flashing to the distance between intersections.

The ¾" x ½" angles formed from 20-oz. copper are soldered to the upstanding legs of the expansion fold. The one-piece cap is clinch-locked to the angles and forms a free-moving, weather-tight cover.



More Apprentices Get Draft Deferment

Washington, D.C. — The deferment of apprentices for the purpose of completing their apprenticeship has increased more than 14 percent since October 1956, according to Edward E. Goshen, executive director, Apprenticeship Service of the U. S. Department of Labor's Bureau of Apprenticeship and Training. On October 31, 3765 apprentices were in deferred status. This increased to 4024 on March 31.

An executive order provides for the deferment of apprentices on a basis similar to that of the deferment of students. Although termed deferment, it is actually only a postponement, and the apprentice is still liable for military service up to age 35, Mr. Goshen said.

Construction Value Rises 10 Percent

Washington, D.C. — The dollar value of new construction put in place in April increased seasonally by 10 percent to \$3.5 billion, according to estimates of the Department of Labor and Commerce.

With this advance, the overall spending rate for new construction remained slightly ahead of a year ago. The total outlays for the first four months of more than \$12.5 billion set a new record, up 2 percent over the total for the same period last year.

The gain was registered entirely in the public construction segment, since private outlays for both April and the first four months were off slightly from last year's record.

The flattening out in private building activity has resulted mostly from the downward trend in housing and store building. Industrial and most other types of private nonresidential activity are still running well ahead of 1956.

Shift in Ownership Revealed by Firm

MINNEAPOLIS — A group of Twin City businessmen have purchased controlling interest in Waterman-Waterbury Co., manufacturer of heating and air conditioning equipment with headquarters here. The news came in the midst of the company's 50th anniversary year.

The new owners include: David E. Sedgwick, president, who increased his previous stock holdings; Ray J. Dervey, formerly general sales manager of American Hoist & Derrick Co.; Joseph E. Erickson, vice president and director of Northwestern Refining Co.; Arthur W. Carlson, president of a Minneapolis financial advisory service, and Edward A. Danforth, Minneapolis attorney.

Harry G. Cross, who will continue as chairman of the board of the company, announced that the firm's first long range goal will be to double production within three years.

Mr. Sedgwick will remain as president. Mr. Dervey will become executive vice president, and Mr. Danforth vice chairman of the board and general counsel. John D. Holmgren, secretary-treasurer, will remain on the board. Mr. Dervey, Mr. Carlson and Mr. Erickson will also serve on the board.

Present officers and operating officials of Waterbury will continue in their present assignments, and no changes in the management or operation of subsidiaries is contemplated.

Use of Gas for Heating Shows 8 Percent Gain

NEW YORK CITY — The gas utility industry has increased its total of gas househeating customers to 16.7 million during the 1956-57 heating season, an 8.5 percent gain over the previous year, American Gas Association reported. The AGA predicts the figure will rise to nearly 20.5 million by the end of 1959.

Central Cooling Up 15 Percent in '56

Washington, D.C. — Central cooling units were installed in at least 150,000 homes during 1956, the Air-Conditioning and Refrigeration Institute reported. This was an increase of 15.4 percent over the 130,000 reported the previous year. In addition, 1,280,000 room cooling units were sold for installation in homes during the year, ARI said.

George S. Jones, Jr., managing director of ARI, declared that the 150,000 figure for central units in 1956 is "conservative, but that a more accurate figure would be difficult to arrive at."

Mr. Jones predicted that sales of central cooling would break all records in 1957. He cited the recent survey by the Du Pont company showing that the more people are exposed to home cooling the more they want it in their own homes.

Steel Industry Hails 100th Anniversary

NEW YORK CITY — The steel industry has begun its celebration of the 100th anniversary of the mass production of steel in the United States with the opening of a Steel Centennial exhibit here in the main rotunda of Pennsylvania Station. The exhibit depicts significant developments in steel's history and the important role of steel in the growth of the country.

During the next eight months the industry will honor two great inventors — William Kelly of the United States and Sir Henry Bessemer of England, whose discovery of the pneumatic steel-making process ushered in the "Steel Age."

Although steel had been made in small quantities since ancient times, it was the invention of Kelly and Bessemer that permitted steel to be produced in large tonnages.

all-purpose relay!



The R847 above is being installed to handle a 22 anip motor load. Designed for use with a sensitive low voltage controlling instrument. R847A models include a transformer. The B model is used with an

external transformer. The R447, not shown, is for use with a line voltage controlled with a separate power supply. Both the R447 and R847 are heavy duty relays.

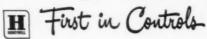
Unbelievable, what a single relay will do-just check these specifications

SPST or DPST switching action. SPST rating: 22 amp full load, 100 amp locked rotor at 230 volts. DPST rating: 16 amp per pole full load, 72 amp locked rotor at 230 volts. • R847A has 24-volt coil and transformer in

115, 208 or 230 volts. • R847B has same relay with 24-volt coil: power is furnished by remote transformer. • R447A has no transformer, but has a 115, 208 or 230-volt pull-in coil available on the relay.

Call or write today for full details

Honeywell



It is possible...a truly

Honeywell's new R447 or R847 relay so versatile you can modify it in the field

Ow, A SINGLE relay for any of your needs! You just choose from Honeywell's R447 or R847 for the relay adapted to the specific voltage control you use.

You can modify the R447-R847 to either SPST or DPST right in the field in a matter of minutes.

No other relay offers so many advantages. The R447-R847 is pre-wired for easy, money-saving installation. Your stocking is simplified. And Honey-well's time-tested components give you assurance of

dependable, trouble-free performance for years.

And when you deal with Honeywell you take advantage of the best field service in the industry, backed by years of engineering experience plus the most complete line in the industry.

Find out more about the R447 or R847 and Honeywell's complete line of relays—most complete in the industry. Call your local Honeywell office. Or, write directly to Minneapolis-Honeywell, Dept. AA-6-183, Minneapolis 8, Minnesota.

The R447 or R847 is the answer to any of these applications—and more

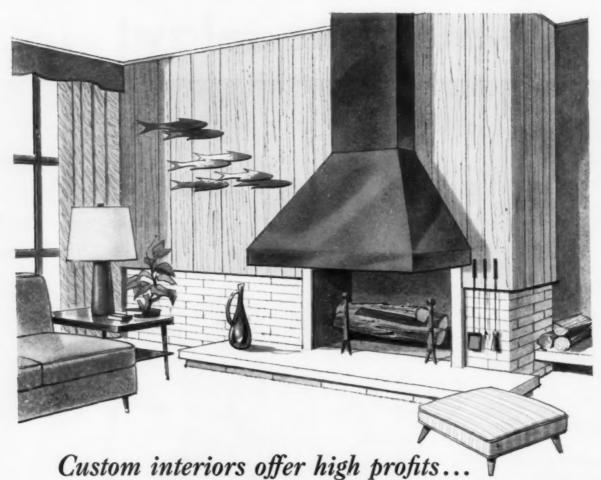
- 1. Air Conditioning units up to and including 2 h.p.
- 2. Other refrigeration applications within specifications of relay—
 (walk-in boxes, milk coolers).
- 3. Heavy duty circulating and ventilating fans.
- 4. Heavy fan coil units and unit heaters.
- 5. Miscellaneous motor loads up to 3 h.p. for both 1 phase or 3 phase.
- 6. Electric non-inductive loads.



Honeywell Round, T87

-world's most popular beating-cooling thermostat.

This rugged and sensitive thermostat, available with a choice of Honeywell sub-bases, offers the most versatile control combinations available in the industry.



Cusiom interiors offer night profits...

make it COPPER

Today's master builder is well aware of the sales appeal of copper as an interior feature. His big problem is where to obtain production items or handcrafted custom work to fill his needs.

This is a newly developing market that offers you realistic new profits!

Why not give some thought right now to the planning of some building products made of copper. And, right from the beginning, make it Hussey Copper . . . and be right from the beginning. We supply copper in all its forms from sheet to wire and in all popular analyses and finishes. For your convenience, check the Hussey Copper Warehouse near you.

BUILDING PRODUCTS • SHEET • WIRE • COILS BARS • STRIP • TUBING • ROOFING PRODUCTS



HUSSEY COPPER

C. G. HUSSEY & COMPANY • (DIVISION OF COPPER RANGE CO.)
ROLLING MILLS AND GENERAL OFFICES: PITTSBURGH 19, PA.

7 Convenient Warehouses to Serve You . . .

PITTSBURGH (19) 2850 Second Ave. CHICAGO (18) 3900 N. Elston Ave. CINCINNATI (37) 1045 Meta Drive PHILADELPHIA (30) 1632 Fairmount Ave.

ses to Serve You . . .

St. LOUIS (1)
Central Terminal Bldg. 5318 St. Clair Ave.

NEW YORK, LONG ISLAND CITY (6)

34-39 Thirty-first St.

the quality tells...the quality sells

new_JANITROL waterless

ADD-ON COOLING SYSTEM



adapts most any warm air furnace for powerful, efficient summer cooling ... features exclusive PRIDE O' YARD air-cooled compressor-condenser unit





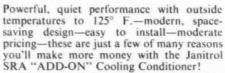
Golden Key TO PROFITS in air conditioning

.with this 7-point program for SALES



A complete quality line...including the most powerful air-cooled "add-on" unit in the industry!





It's a natural for the lush modernization market. Adapts most any warm air furnace for full central cooling. No floor space needed. Evaporator coil mounts in duct in either upflow or downflow systems. Waterless operation eliminates plumbing, sewage, water supply problems. 2, 3, 4, 5 and 6 HP sizes.

Exclusive "PRIDE O' YARD" Com-

Exclusive "PRIDE O' YARD" Compressor unit, styled by a leading designer, is specially-engineered for operation with outdoor air up to 125° F. And its beautiful, streamlined housing completely outmodes them all—eliminates that undesirable "dog house" look!

No doubt about it! The Golden Key to Profits is yours with this great new Janitrol's SRA and all the other models in Janitrol's complete line of air-cooled and water-cooled conditioners. PLUS—2, 3, 4, 5, 6 and 7 in Janitrol's new 7-point program for sales!





JANITROL HEATING AND AIR CONDITIONING DIVISION Surface Combustion Corporation, Columbus 16, Ohio

Please show me how Janitrol's 7-point program for SALES can give me the GOLDEN KEY TO PROFITS.

NAME		
COMPANY		
ADDRESS		
CITY	ZONE	STATE
4482 SRA	Fill in and MAIL TODAY!	

new, low trade net prices

Advanced Janitrol engineering—new automated production methods—volume building sales leader-ship—all add up to more profits on every sale. This new Janitrol pricing plan lets you move in on competition with top-quality Janitrol products at really competitive prices!

3 new dealer stocking plan

As a Janitrol dealer qualified under this new plan, you'll keep your working capital working, instead of "freezing" it in inventory. You'll have the inventory you need for prompt deliveries, better service, year 'round.

A new retail customer finance plan

Makes Janitrol cooling and heating easily available to the six out of ten families who haven't the cash but have the credit . . . on easy installment terms. No down payment. Up to three years to pay. Finance up to \$3500. No risk or recourse to dealer, no collection problems. Eliminates red tape and delay. Keeps "hot" prospects from cooling off!

5 new local level promotions -

A high-impact, sales-producing merchandising program created by Janitrol for your needs, your market, your profit ambitions! Newspaper ad mats, radio and TV musical announcements, window and in-store displays, color-illuminated outdoor signs—all yours as a qualified Janitrol dealer. And Janitrol sets up the complete program to the last detail, saves your time for selling.

6 new builder promotion puckage

A complete merchandising program to help you snare your share of the new house market. Chock full of tested promotion ideas that give you a running start on competition—let you offer the builder a service that enables him to upgrade his houses with quality Janitrol equipment, appeal to more prospects, stay competitive!

7 new select dealer program

Today, Janitrol recognizes a new era in companydealer relations. The days of "playing it by ear" are no more. There's a need for continuing close cooperation between both parties—an "open door" for exchange of ideas. The Janitrol Select Dealer Program makes these things possible, and gives you extra benefits besides. Business development counsel, training schools, prizes, vacations, to mention a few. Right now's the time to qualify!

get your Colden (as TO PROFITS with JANITROL

Ask your JANITROL representative for the facts or RUSH THE COUPON TO US! NO OBLIGATION!

Complete line of gas and oil furnaces, unit heaters, conversion burners, water cooled and air cooled summer conditioners, combination heatingcooling conditioners.

Now available – for you! VALUABLE NEW BOOK

on



INDUSTRIAL QUALITY...FRACTIONAL H.P. ELECTRIC MOTORS



INDUSTRIAL QUALITY
FRACTICMAL
MORSEPOWER
48 FRAME AND
56 FRAME
1/20 to 1 MORSEPOWER

CPEN AND ENCLOSED TYPES PAGES 3 TO 8 MECHANICAL VARIATIONS PAGE 7 ELECTRICAL TYPES PAGE 8 GATINGS AND DIMENSIONS

Formasco Rated[®]
MOTORS
Complete Line
1/20—400 H.P.

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Performance Rated

Mail Coupon Today
for your personal copy of
this informative book

Right at your desk, make a detailed inspection of Century's Fractional H.P. single phase and polyphase line of motors, designed to latest NEMA standards! This fact-filled new book gives you the comprehensive story on Century's new 48-Frame and 56-Frame INDUSTRIAL QUALITY Motors...tells how and why they're better performers than the older models, why they weigh less, take less space, are easier to handle.

Motor types and mountings are described, stator and rotor construction, how to select proper torque and speed...and many other facts to help you choose the right motors for top performance...all along the line!

To CENTURY ELECTRIC COMPANY

1806 Pine Street, St. Louis 3, Mo.

Please send New Bulletin 1-IPI to:

Сотрапу....

en.

Ctuta

Performance-Rated MOTORS
1/20 to 400 H.P.



CENTURY ELECTRIC COMPANY

1806 Pine Street . St. Louis 3, Missouri . Offices and Stock Points in Principal Cities



Six Reasons for Turning to Ryerson for Steel

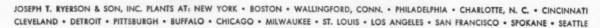
Sheet metal fabricators tell us that these six reasons keep them coming back to Ryerson for galvanized and every other steel requirement:

- 1. Exact length on net weight basis—When your galvanized can be cut from stock width coils we can furnish 4 to 16-foot lengths in $\frac{1}{4}$ " increments—with the savings of a net weight price.
- 2. One sure source for all requirements—Nobody comes even close to equalling the size and variety of Ryerson stocks—whether steel is in scarce or plentiful supply.
- 3. Highest quality—For example, bright, ductile galvanized sheets, uniform in coating and true to gauge, that work easily and form without danger of cracking or peeling!
- 4. Correct weight-and fair prices year in and year out.
- 5. Good packaging—Tightly banded steel, skidded with sound lumber, cuts labor costs, adds protection to the steel and makes handling easier!
- Absolutely dependable delivery—A priceless assurance when delays could mean idle workmen or even lost business.

Next time you need galvanized—or any kind of steel—turn to Ryerson with complete confidence.

RYERSON STEEL

PRINCIPAL PRODUCTS IN STOCK: Sheets of every kind—carbon steel, stainless, expanded metal, etc., bars and band iron, tubing, angles, channels, etc.



No Gimmicks Needed



MOST OF THE STATE and national associations have already held their conventions for 1957. It's interesting to note that each convention program had at least one speaker on the important subject of selling at the dealer level. Each speaker endeavored to show that more selling effort on the part of the dealer would ultimately result in better prices for the work performed and in better heating, cooling and sheet metal installations.

The old opinion that a good salesman must be born with the gift of selling has been blasted time and time again. Selling is a trade that must be learned, and it is as important as any other job performed in a business organization. In fact, selling is the most important trade in any business because every member of a company must learn to sell his abilities. If the combined abilities of every company employee are thoroughly sold to the prospect, the salesman's job is to prove those abilities are worth every dollar he asks for the job.

At Cincinnati, C. O. Dudley, sales consultant from Columbus, O., told delegates to the National Warm Air Heating and Air Conditioning Association convention, "To open the prospect's mind to your presentation, you must follow certain recognized steps in this order: 1) prepare yourself ahead of time; 2) have a good introduction; 3) capture the prospect's attention; 4) gain his interest; 5) provide him with important information; 6) make him dissatisfied with his present situation; 7) demonstrate how your product and services can be best used; and 8) close the sale."

At St. Paul, B. H. Berry, vice president, 1st Bancredit Corp., described to members of the Sheet Metal Contractors' Association of Minnesota some of the buying habits of the public and explained how these habits can be used to develop sales from a minimum priced job with a low margin of profit potential, to a well designed, quality installation which provides a fair return to the dealer for his knowledge and skill.

In Indianapolis, Edward Kirsch, Belnap and Thompson, Inc., told dealers attending the Sheet Metal and Warm Air Heating Contractors' Association of Indiana how to avoid answering a request for an outright price quotation. Mr. Kirsch said, "When price is the main interest, set it aside by bringing out a new sales point."

In Milwaukee, dealers who had participated in the local WHAM (Warm air Heating and Air conditioning Modernization) program described, in an open forum, how the advertising campaign had helped them make better sales out of each inquiry. It gave them something to talk about that made a higher price seem worthwhile.

So it has gone at each of the state and national meetings in our industry. More and more time has been devoted to suggesting how dealers can upgrade a sale to the point where they are fairly compensated for the use of their abilities to select, install, balance and service the equipment required to meet the prospect's problems.

No new gimmick is needed to solve the dealer's price problem. All we need is more effort on the selling of the many features we already have. Time spent enumerating all of the many sales points a dealer now has will provide all the ammunition needed to build the inquiry into the type of sale every dealer desires.



Home show exhibit promotes cooling sales with plastic air conditioned room

Two Keys Unlock Doors To Big Volume Business

A well trained and efficient organization backed by a consistent program of promotion have enabled this company to build a million dollar sales volume

IN THIRTY YEARS University Heating and Air Conditioning Co., San Diego, Calif., has grown from a small sheet metal shop to what can be considered a big business. An idea of its size can be gained from the fact that it employs more than one third of the sheet metal workers in the San Diego area, which has a population of more than 800,000. During the past three years the company's business volume has doubled in size. This is a remarkable record even in an area of rapid population growth.

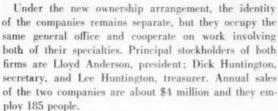
The story of any business success is primarily the story of people, the people who manage and operate it—down to the last employee. University Heating has recognized this fact by establishing a well trained and efficient organization. And in addition, the company's sales story

is kept before the public with a consistent program of advertising. These have been the two keys to its success.

The company was founded in 1926 as a sheet metal shop and through the years became well established in the local residential warm air heating and cooling field. In 1951 University Heating became affiliated with a second firm, Ben Huntington and Sons. The Huntington company specializes in the plumbing and steam fitting field. The two companies had previously worked together for several years in submitting joint bids. This close relationship was made more permanent by incorporating both companies and establishing joint ownership through an exchange of stock among the partnership owners.



ENGINEERING staff, kept busy with designing and estimating, includes registered engineers



University Heating maintains a branch in Escondido, a rapidly growing area 35 miles from San Diego. This branch functions largely as a separate company insofar as sales, installation and services are concerned. Purchasing and general administration, however, are conducted through the main office.

The company handles a wide variety of heating and cooling work, ranging from large home projects, custom built houses, and modernization in older homes, to commercial buildings, schools, and government and industrial projects.

No small measure of the company's success can be credited to its consistent program of advertising and to its specialized selling organization. There are four sales crews operating through two divisions. Two sales crews direct their activities toward existing structures, one specializes in residential and the other in commercial jobs. The other two sales crews handle new construction with a similar division between residential and commercial. Each salesman in turn spends a day in the office on floor duty. All direct leads coming into the office are referred to this salesman for follow-up.

New Plan Sells Service

Recently the company has established a plan to sell service. In the past, service has never been a paying proposition, although it has been an essential part of the business. The new plan is designed to bring service operations in line with costs and to enable the department to show a profit on the company's books at the end of the fiscal year.

Under the new service plan, each customer is sent a



LARGE volume of project work permits the use of mass production techniques in the shop

service contract. Separate forms are used for residential and commercial users. The contracts are in the form of mailing folders and they enumerate all the advantages of the contract. Two "package" service plans are offered at different prices. A business reply envelope, requiring no postage, makes it easy to return the signed contract. As a further inducement the contract offers a 10 percent discount on materials to contract signers.

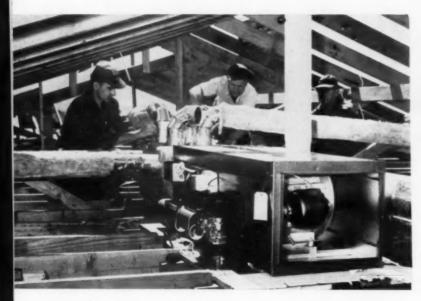
The use of service contracts makes it possible to route servicemen more efficiently and to balance labor requirements during the year. This saving is passed on to the customer by offering the package rates and the discount.

The company's advertising is scheduled regularly in the San Diego newspapers and also in the newspapers in Escondido, El Cajoy and other nearby communities. Ads are also run in a regional magazine, in the San Diego Medical Bulletin and the San Diego Builder. The advertising is handled by a professional agency under the direction of Dan Baker, the company's advertising and sales promotion manager.

Advertising Based on Sales

The allocation of advertising is based upon sales in the various departments. However, more emphasis is now being placed on modernization of homes, and on doctor's clinics, offices and plants. The type and amount of advertising varies according to season. Summer air conditioning ads begin about March 15 and run through August for both residential and commercial work. From August 15 to October 1, heating and year 'round systems are emphasized. From September to December, the advertising program is not as heavy as in other months since this is the peak of the installation season. A separate advertising campaign promotes the use of service contracts.

In addition to newspapers and magazine advertising, direct mail is used extensively. Some direct mail pieces feature customer testimonal letters. As an exhibit at home shows, the company uses a room made of sheet plastic walls. This enclosed area is completely equipped with





Working efficiency careful scheduling

DURING the winter the company averages 300 housing project installations per month. Crews specialize in this work and develop great efficiency

heating and cooling which can be operated alternately to demonstrate how air is conditioned for summer and winter.

All major manufacturers whose products are handled by the company participate in the sales promotion and advertising program.

Operations Departmentalized

Because of the company's size its operations are departmentalized. The engineering department designs heating and cooling systems, estimates jobs, and performs engineering liaison duties on projects underway. The engineering staff includes several registered engineers.

For top efficiency, several installation divisions have been set up. In residential work, one crew specializes in large housing developments. A second crew handles work in custom built homes, and a third specializes in modernization work in existing homes. For commercial work, one crew is available for new construction, and another handles modernization in older buildings. All of the crews are staffed with mechanics having many years experience. The average amount of experience in heating and cooling is 15 years per mechanic.

Installation work in housing developments is set up on a production basis considerably different than for custom built homes or modernization. During winter months, housing project installations number about 300 per month, and reach an even higher peak during the summer. At present the company has 17 housing developments under contract.

Project Contractors Cooperate

The general contractors cooperate very closely with University Heating on project work to maintain a schedule of operations that will permit efficient use of labor and materials and avoid delays. Installation crews will not move to a job location unless there is a minimum of three houses ready for heating equipment. The project installation force consists of 10 men who are paired in crews of one journeyman and one apprentice. The two men are kept together as far as possible on all jobs, since it has been found that they work more efficiently.

Materials and fittings are produced in the company shop for 30 houses at a time. Then these materials are delivered by truck in advance and stored in finished garages at the job site. From the garages, the material is distributed to each house in advance so that no time is lost on the job. Usually materials are laid out for at least six houses at one time. This method of handling eliminates the need for large company storage facilities.

A journeyman and apprentice will complete the first step of the heating installation in an average of three houses per day, but in some instances this can be stepped up as high as five per day. This first step includes location and installation of all duct work.

When finishing the installation, the company requires that at least six houses a day be available from the building contractor. The two men then set the registers, thermostats, and install the furnace. On project work, all makes of furnaces are delivered directly to the job by the supplier, eliminating any need for storage.

Naturally, in installation work on individual, custom built homes mass production procedures cannot be used, so the operation is more costly. Each job must be designed and figured separately on the basis of the plans. The installation crew must adapt its working procedures to the individual job.

Installations in older houses presents still greater problems. Crew members may be required to do some excavation, a little carpentry, or even electrical work. The

is increased by and specialization

CAREFUL scheduling of work in housing developments makes certain that all materials are on hand when and where needed to prevent delays



simple act of cutting into a partition or wall may involve numerous complicated problems.

Six Men Assigned to Service

University Heating employs six men exclusively on service. These men have been carefully trained, and each is assigned a fully-equipped truck with spare parts and tools to handle practically any situation they may encounter.

Service calls and complaints are received and handled by a girl clerk trained for this work. The job requires much tact and patience. The city has been divided into zones and each service man is assigned a definite zone so that he is familiar with his territory. The calls are routed to the service men each morning. The men are required to call the office at least four times a day to check on emergency calls.

A year's free service is included with each installation. A record card on each installation gives all important information, including make of equipment, filter, location, etc. On the back of the card, space is provided for recording service calls, the name of the service man, and payment. Two of these cards are kept on each installation, one pink and one white. The pink card remains in the file at all times. The white card is given to the serviceman when making a call. He then returns it with the job invoice. The invoice is prepared in triplicate with one copy for the customer, one for billing and a third for the serviceman's records. The white card is returned to the file after billing.

Uses Forty Trucks

For both installation and service the company uses 40 trucks of all types. There is also a fork lift truck at the

shop for handling heavy jobs. All of the trucks are company owned, but repairs and maintenance are handled in an independently owned garage. Careful records are kept of all repairs, lubrication and fuel costs.

No company garage facilities are kept, since the drivers drive their trucks home from the job. This practice not only eliminates expensive storage facilities, but also permits men to drive directly to the job in the morning without loss of time to pick up their trucks. During the peak period large trucks are sometimes rented if needed. A blanket insurance policy is carried on all trucks with liability coverage amounting to \$200,000 on each driver and \$600,000 for each accident.

A completely equipped sheet metal shop is maintained at the general office location with an additional warehouse and shop nearby. Nearly all of the duct and fittings used are produced in the shop with modern machinery. A production line enables sheets to enter at one end and come out at the other as finished products. The large volume of work keeps the shop busy through the year. By manufacturing its own sheet metal parts, the company is able to prevent buildup of an excessive stock of fittings.

Machine accounting helps provide rapid cost figures on every job and up-to-date information for the sales department. It also speeds the handling of the payroll and reports on operations. For example, reports on backlog orders are furnished regularly to every department. What may be called an incentive report card is sent to all salesmen and installers. This card lists jobs on the basis of gross profit. Salesmen are also sent lists of users of the company's equipment. This information is useful in soliciting business, since a salesman is generally in a position to refer a prospect to a neighboring customer.

This efficient organization has enabled University Heating to solve most of the problems of greatly expanded business volume.

To Tell Your Prospects That You Know Air Conditioning.



This "Air Conditioning Seller - Owner - User" certificate, 14 inches by 17 inches in size and suitable for display or for framing, tells your prospects that you have valuable firsthand experience of the advantages and benefits to comfort, health and efficiency provided by air conditioning. It is available, without cost or obligation, from American Artisan, as explained on the next page.

Editorials in the February and May issues of the Artisan have stressed the value of first-hand air conditioning experience. They pointed out that every-one selling and installing air conditioning should also be a user of air conditioning in his own home and/or place of business. American Artisan's suggestion has been widely quoted by the industry as a good method of promoting the increased sale and use of year 'round air conditioning.



• • • • A Special Announcement By the Editors

- You are invited to apply for an AMERICAN ARTISAN "Air Conditioning Seller—Owner—User Certificate" if you have central summer air conditioning in your own home and/or in your place of business. Suitable for display, it certifies to your customers and prospects that you know, through first-hand experience, the many advantages and benefits to comfort, health and efficiency provided by year 'round air conditioning.
- AMERICAN ARTISAN's suggestion that dealer-contractors, wholesalers and manufacturers can't beat first-hand experience as a home air conditioning sales tool is being well-received by our industry. As we said in February and repeated in May those who live in an air conditioned home or work in an air conditioned office are in a strong position to tell prospects of the many advantages.
- AMERICAN ARTISAN now makes it easy to tell your potential air conditioning customers that you have this valuable first-hand experience. If you have central summer air conditioning in your home and/or your place of business, fill out and mail the coupon below. We will rush you free a copy of the new "Air Conditioning Seller—Owner—User Certificate" suitable for framing or for display in your showroom or office. There is no charge or other obligation.

MAIL name,
THIS for fre

To: The Editors American Artisan

6 N. Michigan Ave.

Chicago 2, III.

Please send me free, inscribed with my name and my company name, an "Air Conditioning Seller—Owner—User Certificate" suitable for framing or for display.

I have central summer air conditioning in my home, installed

______ hp.

I have summer air conditioning in my place of business, installed

(month and year). Its capacity is

hp.

(Please print)

Name:

Company: ______Street Address:

City and State:

Signed:

TODAY



COOLING DEALERS'

How to Solve Engineering and Installation Problems in Residential Cooling

Don't Take Blower Motor for Granted

Even this work horse can break down due to excess loads and inadequate maintenance. Knowledge of the factors which affect the blower motor can help the serviceman locate electrical troubles throughout the system

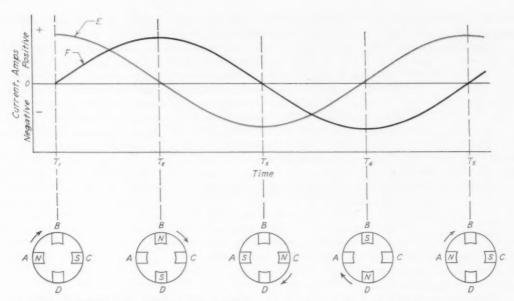
By S. W. Reid
Air Conditioning Engineer
Gilbert Associates, Inc.

WHEN COMPONENTS of an air conditioning system are evaluated for service, the blower motor must be classified as a dependable work horse. When properly applied it does its job faithfully season after season with very little attention. While other components are subject to frequent face lifting to produce new models, the blower motor remains essentially unchanged yet ready to perform its task. It is, of course, not to be inferred that we are presently enjoying

the ultimate in blower motor design. Improvements will continue, but they are generally unheralded and unnoticed, at least so far as the buyer of an air conditioning unit is concerned.

Because of its dependable operation, the blower motor does not, in many cases, receive the attention it deserves, either from the dealer who determines its load or from the owner who may not have been properly instructed in its care. Dealer difficulties and owner complaints can both originate with this component when the rules governing its application are broken in installation or in maintenance.

To become better acquainted with the blower motor let us begin by considering the two types of motors generally applied to small fans and blowers. These are the split-phase type and the general purpose, capacitorstart type. Both are fractional horsepower motors designed for single-



1 TWO ALTERNATING CURRENTS (E and F) feed into stator coil shown in Fig. 2 to cause a rotating magnetic field

phase, alternating current. Both motors are constructed with a main or running winding and an auxiliary or starting winding. The basic difference between the two motors is that the capacitor-start motor requires a capacitor in series with its starting winding.

Currents Are Out of Phase

The fundamentals of a single-phase motor are illustrated in Figs. 1 and 2. Fig. 1 represents two alternating currents plotted as amperes versus time. Note that when current E is at its maximum value either above or below the zero line, current F is passing through the zero line, indicating no current. Correspondingly, when current F is maximum in either direction, current F has a value of zero. The two currents, F and F, are displaced from or out of phase with each other.

Suppose the two currents in Fig. 1 are fed to a motor stator as shown in Fig. 2. The stator is simply a laminated ring of soft iron with four poles projecting inward as shown. Note that each wire is wrapped around opposite poles in a manner that will cause them to have opposite polarity when current is flowing. Now, referring back to Fig. 1, let

us choose certain significant instances on the time scale and relate them to the magnetic effect created on the stator.

Current Flow Changes Poles

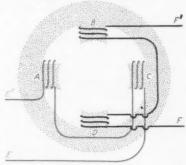
The first significant instant, shown as point T_1 in Fig. 1, occurs when current E is maximum above the line and current F is zero. At this moment, let us assume that current is flowing from E toward E' in Fig. 2, and that this makes A a north and C a south pole as recorded in the small diagram under point T_1 .

The second significant instant, shown as point T_2 in Fig. 1, occurs when F is maximum above the line and E is zero. At this moment let us assume that current is flowing from F toward F' in Fig. 2, making B a north and D a south pole.

At instant, T_3 , current E is again at a peak value only this time below the zero line, and F has a simultaneous value of zero. Current now flows from E' toward E causing a reversal of the polarity noted at the first instant. A is now a south pole and C a north pole.

At instant T_4 , we find current F is now flowing from F' to F and that poles B and D are respectively south and north. At instant T_5 the cycle is

Laminated ring of soft iron



2 EACH WIRE in stator is wrapped around opposite poles in a manner which causes them to have opposite polarity when current flows

completed— T_5 shows the same arrangement as T_1 .

Magnetic Field Rotates

Between T_1 and T_5 the north and south poles have traveled completely around the ring. In other words, at T_1 pole A was north. At T_2 north had moved to pole B, at T_3 to C, at T_4 to D and finally at T_5 back to A again. The term applied to the moving pole arrangement is rotating magnetic field.

Between the poles of the rotating field is mounted the rotating part of the motor. It is cylindrical in shape and has a set of parallel rods or bars of copper at equal intervals around the circumference, giving rise to the common designation of squirrel cage. The bars are all joined together at the ends by rings or plates. As the field rotates, a flow of current is induced into the rotor bars. This induced current sets up counter-magnetic forces in the rotor which interact with the stator magnetic field to cause the rotor to turn in the direction in which the field rotates.

Motor Runs on Single Current

If one of the two out-of-phase currents is interrupted while the motor is running, the motor will continue to run and will carry the load. If, however, the rotor stops, it will not start again with only one of the two currents, since one current alone does not create the rotating magnetic field as described. We should understand, therefore, the purpose of the auxiliary or starting winding in a split-phase or in a capacitor-start, single-phase motor.

The next question is, how are the two out-of-phase currents required to start the motor obtained from a single-phase source of power? A detailed technical explanation can be found in any electrical engineering text. The important thing to know is that coils and condensers (capacitors) through which an alternating current passes both affect the time at which its peak value occurs. Thus, in Fig. 1, if current E passes through a different type of stator coil than does current F, their peak values will not occur at the same time but will be displaced as shown.

In the ordinary split-phase motor, the starting coil is designed with the proper combination of inductance (the effect produced by current passing through a coil) and resistance to produce a starting torque about 1.4 times the full load torque. In the capacitor-start motor a capacitor is inserted in series with the starting winding to produce a greater displacement of the two currents than is possible with the simple split-phase motor. This results in a starting torque of approximately 2.75 to 3.75

times the full load torque. Both motors contain a centrifugal switch to disconnect the starting winding as soon as the rotor speed has reached about 75 percent of the design speed. In both cases the motor then continues to run with single-phase current only. If the starting winding were not disconnected under normal load, the motor would overheat and the starting winding would burn out.

Capacitor Increases Torque

It was pointed out above that a capacitor in series with the starting winding increases the displacement of the starting current with respect to the running current and thereby increases starting torque. Another way in which starting torque can be increased is by increasing the starting current. Since the capacitor-start motor is more expensive than the split-phase motor, this design might appear to have possibilities. For practical reasons, however, high starting currents are undesirable because they may cause a voltage drop which makes lights flicker. Many utilities have established rules in this respect. In general, 20 amp (plus 15 percent tolerance) at 115-v and 25 amp (plus 15 percent) at 230-v are the limit for automatically controlled single-phase motors. When the control is manual (and therefore presumably less frequent) 40 amp (plus 15 percent) at 115-v and 50 amp

What Is 'Air Conditioning'?

True air conditioning provides comfort in all seasons of the year, according to the American Society of Heating and Air - Conditioning Engineers. The ASHAE defines air conditioning as follows:

"Air conditioning is the process of treating air so as to control simultaneously its temperature, humidity, cleanliness and distribution to meet the requirements of the conditioned space."

(plus 15 percent) at 230-v are allowed.

Starting current should not be confused with running current as given on the motor data plate. The former is the current that surges through a motor as the switch is thrown and before it has begun to rotate. For this reason starting current is usually called locked rotor current.

The type of motor we are discussing falls into a size classification that might be called medium to large fractional horsepower. Normal purpose split-phase motors are made from 1/20 to 1/3 hp, and general purpose capacitor-start motors from 1/6 to 3/4 hp. For ratings of 1/3 hp and above, the latter are usually made for dual voltage operation (115/230-v). The main winding is made in two sections which are connected in either parallel or series at the motor terminal block. The starting winding and capacitor are connected across one section of the main winding.

How to Determine Loads

In the application of the splitphase and capacitor-start motors there are certain factors with which the air conditioning dealer should be familiar. The matter of motor loading is very important. A commonly used method for determining load is to compare the field measured amperes which a motor draws with the rated value given on the data plate. This procedure is not entirely reliable for several reasons. One is that for single phase motors the full load ampere reading may range only up to 50 percent above the reading at no load. Since a 15 percent change in current may mean a 25 to 35 percent change in load, the ampere ratio may not be determined with sufficient accuracy to give a true picture of actual loading, especially in view of the fact that voltage variations and manufacturing tolerances also can have considerable effect on what the actual full-load amperes will be for a particular motor.

The true picture of motor loading can be obtained by measuring watts. This method is not so convenient as the ampere method, since it is necessary to submit complete data to the manufacturer unless the calibration curve for the motor is available.

The temperature at which a motor runs is a function of both its loading and its ambient. Motor life is largely determined by the life of the winding insulation, which in turn is most affected by operating temperature. Continuous duty motors in fractional horsepower sizes are rated at 40 C rise above a 40 C ambient (80 C equals 144 F). For this reason even a cool running motor will feel hot to the touch. Because it has been found that this rating condition is conservative, especially for motors which are operated intermittently such as in a warm air furnace, National Electrical Manufacturers Association has adopted an overload allowance called a service factor (identified on the motor data plate as SF). A motor running within the SF loading will not exceed a 50 C rise. Service factors vary from 1.4 for a 1/20 hp motor to 1.25 for a 3/4 hp motor. Where motors are to operate continuously in fairly high ambients, longest life will be realized if loadings are kept at 100 percent or less.

Tripout Protects Winding

Because winding temperature is so important to motor life, a built-in bimetallic protection device is usually included with the motor to stop it whenever an excessive temperature is sensed. Two circumstances will cause a tripout. One can occur during the starting period. The heavy starting current itself, if prolonged, can generate sufficient heat in passing through the device to trip it. The other occurs during overloaded operation. Excessive heat generated by the main winding is transmitted to the overload device to cause a tripout. For motors used to drive blowers, the overload device would be the type which automatically resets when it cools. Where motors are used to drive loads that require the protective device, it is available in a manually resetting design.

Split-phase motors are usually found applied to small belt or direct

driven blowers, which require little starting torque and which can be brought up to speed quickly. Shaftmounted fans in this class may also be driven with an even simpler type motor which is outside the scope of the present discussion. This motor is known as a shaded pole motor. It is built in sizes from 1/300 to 1/6 hp, but its application is limited because of its low starting torque and low efficiency.

Capacitor-start motors are applied to heavier blowers with higher inertia loads, and particularly to belted fans where various conditions of belt tension and pulley ratios can affect the starting torque and load requirements.

What Causes Overload?

The air conditioning dealer normally is concerned with the blower motor only when he cleans and lubricates it. Occasionally, however, he receives a complaint about a blower short cycling. Investigation will probably show that the blower motor protective device is tripping due to an overload being imposed. We have already touched upon some of the factors which can cause this condition. Let us review these and other factors:

- 1) High air flow. Contrary to what many people think, a forwardcurved centrifugal blower is not overloaded by choking the flow of air. Rather, the load and horsepower requirements increase as more air is handled. Thus, if, for a given motor application, blower speed is increased or system resistance is reduced, the blower will handle more air and will impose an increased load upon the motor. In accordance with physical laws governing the performance of blowers, horsepower increases as the cube of the speed. For this reason, speed changes should be made with caution.
- 2) Tight bearings. Most bearings need periodic lubrication. Otherwise, they become overheated and eventually distort until the shaft binds. Misalignment also causes bearings to become tight.
 - 3) Belt tension. Next to blower

THIS CONTINUING SERIES OF ARTICLES COVERS . . .

. . . all aspects of residential cooling, beginning in the August, 1952 Artisan with a complete rundown on:

FUNDAMENTALS . . .

. . . in a series of 20 articles which described the basic operating conditions of residential cooling equipment. Next, we turned to:

SPECIFIC PROBLEMS . . .

... of maintenance, service, installation and management, describing new techniques and presenting pointers on solving problems common to residential cooling. The current series describes:

CASE HISTORIES ...

which have actually been experienced and reported by dealers. Engineering, installing and servicing of cooling systems and their components are discussed by the author in answer to actual problems expressed by industry members.

speed, belt tension is probably the most important factor in motor loading. If the belt is too loose it will slip; if it is too tight it imposes a severe load on the motor and accelerates bearing wear. Manufacturers' recommendations should be followed.

4) Low voltage. When motor trouble is investigated, motor terminal voltage should be recorded before and during motor operation under load. Low voltage increases motor amperage which in turn overheats the protective device causing a tripout.

Obviously, then, while the blower motor is undoubtedly one of the most dependable components of the air conditioning system, it cannot be overlooked when trouble arises.



THIS IS THE THIRD

... IN A SERIES of reports on tests by the NWAHACA mobile laboratory which seek to expose and solve some of the problems cooling dealers may encounter in installing summer air conditioning systems in the modern multi-level homes

Split-Level Cooling Test Uncovers

Causes for Temperature Differentials

. . . within rooms and among the different levels.

Inspection of ratio of supply to return air, effects of draperies and furniture, cool air drift and outside influences produces some suggestions for design improvements

As the demand grows for central cooling in modern homes, a trend toward the attractive multi-level residence has also become established. To help dealers overcome any obstacles which might arise toward tying these two demands together, investigations are constantly being conducted to locate and correct whatever limitations might exist in providing comfort for this type of home. Tests by the National Warm Air Heating and Air Conditioning Association's mobile laboratory show that areas in split-level houses that are easy to heat are difficult to cool and vice versa.

Problems Assigned to Two Factors

The air distribution problems uncovered during the 1955 cooling season by the National Warm Air Heating and Air Conditioning Association's field investigation committee are probably due to two factors. These are:

 The cool air leaving the evaporator coil is carried through ducts located in spaces which are at higher temperatures than is the air within the ducts. Some of these ducts are in occupied areas and any loss of cooling capacity reflected by the temperature gain of the air passing through these ducts does represent useful cooling. Other sections of the duct system are in areas that are not occupied, such as the basement and between the wall studs, and the amount of useful cooling from these ducts obviously is questionable. All these ducts are uninsulated.

Heat gain to the ducts results in a temperature increase of the circulating air within the ducts and consequently the air leaves the supply air registers in the upper level rooms at a higher temperature than it does in those rooms closer to the cooling unit. Such a temperature gain will be reflected in a larger air flow rate requirement than would be the case if no heat gain occurred. When it is realized that the normal temperature differential of the air across the cooling coil in these jobs was only about 12 to 18 deg, even a small temperature gain of 3 deg can account for a reduction in cooling ability of about 20 to 25 percent.

 Cool air introduced into a room should be thoroughly mixed with the warmer room air to produce the desired indoor temperatures. If the mixing is not complete, the cool air stratifies and settles near the floor. Then in the normal course of events, since there is no dam to restrain the free movement of air, the cool air tends to settle to lower elevations by sliding down stairs and drifting through openings between the levels of the house. This in turn will bring warmer air from the rooms on the lower levels to those on the upper elevations.

One obvious answer is to insulate the ducts in the lower level, basement and crawl spaces. While this appears to be a partial solution during the cooling cycle, it probably would not overcome entirely the difficulties caused by inadequate ducts.

Frame House Has Three Levels

The split-level house described this month is a 48 imes 40 ft frame building with three occupancy levels and a basement. These levels are:

Basement level: utility room (not air conditioned).

Total occupied and conditioned area 1838 sq ft
The basement level is a few feet below the recreation
room and garage on the lower level, which is essentially
at grade level. Over the basement area is the middle level
with living room, dining room and kitchen. One bedroom and part of another on the upper level are over
the lower level heated recreation room. The remainder
of the second bedroom and the master bedroom are
over the unheated garage.

This split-level house has a central summer-winter air conditioning system, the heating-cooling unit of which consists of an oil-fired forced warm air furnace with a cooling coil placed in the plenum above the heat exchanger and a remote compressor-condenser unit.

Two Extended Plenums Supply Home

The supply duct system is divided into two extended plenums, one supplying the bedrooms and bathrooms on the upper level and the other the living room, dining room, and kitchen on the middle level as well as the recreation room on the lower level. Each of these two plenums is equipped with a motorized damper controlled by room thermostats for operation as a two zone system during the heating cycle. Individual 4 in. diameter round ducts take off from the plenums to the perimeter floor registers generally placed beneath the windows on the upper and middle levels. No outlets are provided in the garage. The basement is supplied by several outlets in the side of the plenum ahead of the zone dampers. Perimeter diffusers in the ceiling supply the recreation room on the lower level.

A single 28 × 6 in. return air intake for the middle level is in the baseboard in the living room. The two 30×3 in. intakes for the upper level are in the floor in front of the balcony railing. There is one 14×6 in. intake in the baseboard in the recreation room on the lower level and another 6×8 in. intake cut directly into the return air plenum in the basement. No outdoor air is introduced into the system.

Design Temperature Is 95 F DB

The house is on the eastern seaboard. The cooling design temperature is 95 F dry bulb and 75 F wet bulb outdoors and 80 F dry bulb indoors. The daily range of temperatures is considered low. The outdoor design temperature for heating is zero F.

The building walls are standard frame construction with a shingle siding exterior. Interior wall surfaces are dry wall construction with 2 in. mineral wool batts between studs. The area above the upper and middle level ceilings contains 4 in. mineral wool insulation with a vapor barrier between the insulation and the sheet rock ceiling.

The pitched roof is covered with asphalt shingles on a sheathing base. Four louvers under the eaves provide openings for natural draft ventilation to the attic. Each opening is about 1 sq ft. One triangular louver installed at the top of the gable (15 in. high and 60 in. wide at the base) provides an outlet for attic air.

The recreation room floor is asphalt tile over concrete. The floors of the rooms over the garage are insulated by 2 in. of mineral wool between the joists.

Weatherstripped Windows Have No Storm Sash

Double hung wooden windows with weatherstripping are used throughout the house. No storm sash is used. The windows are well fitted. Most of the windows are provided with full length draperies, but there is no outside shading from trees or buildings. Drainage appears good. Roof drains terminate at the lawn level and the ground generally slopes away from the house.

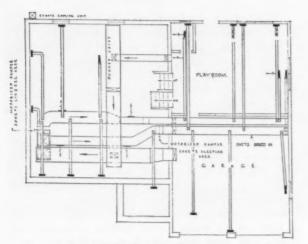
The structural framing of this house is typical of that of most split-level houses, but is better than many with respect to the duct installation in that it was possible to install the duct work without excessive turns, offsets, etc.

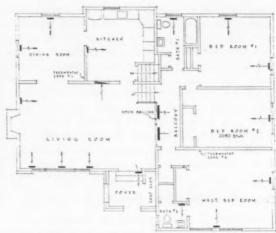
The house was completed in June, 1955 and sold for \$19,500. The dealer's cost for the heating system was \$635, and for the cooling equipment, \$1250.

House Has Oil-Fired Furnace, Air Cooled Unit

The heating unit, fired with a gun type oil burner, is rated at 125,000 Btuh input and 100,000 Btuh output at the bonnet. The blower (used for both the heating and cooling operations) is a 12 in. diameter wheel rated at 980 to 1380 cfm at speeds of 639 to 790 rpm, and is driven by a 1/3 hp motor with variable pitch pulley.

The V type cooling coil mounted in the supply air plenum above the heat exchanger is a three row coil with a total face area of 4.5 sq ft.





TWO EXTENDED PLENUMS (basement plan, left) supply 1) bedrooms and baths on upper level and 2) living room, dining room and kitchen on middle level (floor plan, right) as well as recreation room on lower level. A single return air intake is used on the middle level; the upper level has two; the recreation room, one; and the basement, one

The remote compressor-condenser unit is located outdoors at the south corner of the house. The compressor is rated at 36,000 Btuh with a 3 hp, 230-v, single-phase, 60 cycle motor. The air cooled condenser has a four row coil with a face area of 5.65 sq ft. The condenser blower is a 12 in. diameter wheel driven by a 1/3 hp motor and is rated at 2250 cfm at 525 rpm.

Zone Controls Used

The portion of the control system which responds to room air temperatures is a two zone system with two motorized, two position dampers in the duct system, each under the control of a separate thermostat. The rooms on the upper level constitute one zone and those on the middle and lower levels, the second zone. Supply air flow in the basement is not controlled. This zone system operates only during the heating cycle. During the cooling cycle the zone dampers remain fully open and a room thermostat in the middle zone controls the cooling equipment.

The furnace has the customary oil burner primary control, fan switch, and high limit controls. The cooling compressor and condenser air fan motors have the customary starting equipment and overload protection. The pressure controls on the compressor are set at:

The duct system blower operated on the same cycle as the compressor motor during the survey; however, the main thermostat is equipped with control switches which permit continuous or intermittent blower operation as desired.

Heat gain calculations were made by the method prescribed in NWAHACA Manual 11. The total heat gain is 26,370 Btuh, or approximately 2.2 tons. This includes 2730 Btuh heat gain for the recreation room, but does not include any gain from the utility room.

The heat gains for each level are as follows:

	Btuh	Percent
Lower level	. 2730	10.3
Middle level		
Upper level	.10980	41.6
Total	26370	

The heat gain of 26,370 Btuh for the floor area of 1838 sq ft amounts to 835 sq ft per ton of refrigeration load.

The design heat loss is 72,430 Btuh, based upon an outdoor temperature of zero. This is 2.75 times the design cooling load.

The prevailing weather during the five day test period was for the most part warm, clear, and sunny. The temperatures were milder near the end of the survey period. Light rain fell during two of the days.

On the datum day, August 21, 1955, the temperature rose quickly in the morning. There was little wind, humidity was low, and skies were clear all day. The 93 F maximum temperature occurred at about 2:45 p.m.

The only adjustments during the test period were made on the controlling thermostat twice when it stuck in the demand position.

Temperature Differentials Large

The range of room temperature differentials at the 60 in. level in the three levels of the house is relatively large. A low of 63.3 F in the recreation room on the lower level and a high of 79.2 F in the living room on the middle level were noted. The middle level is generally warmer than the upper level. At the 60 in. level the living room was 16 F warmer than at the 60 in. level

"... It appears the cool air delivered to the upper two levels has been collecting in the lower level rooms."

in the recreation room on the lower level at the time of the test.

The living room showed the highest temperatures. The four supply air registers in this room were found partially closed and the air flow rate measured 282 cfm.

Stratification Varies from Excess to Minimum

The temperature stratification of the air in the upper and middle level rooms is unusually high. Air temperatures near the ceiling are not particularly significant to occupants' comfort but the magnitude of floor to ceiling stratification is interesting. The temperature difference from floor to ceiling averaged 10.2 deg on the upper level and 13.1 deg on the middle level. Temperature differences from floor to the 60 in. level, more significant to comfort, were 7.7 deg on the upper level and 9.5 deg on the middle level.

The conditions on the lower level (recreation room) are interesting by contrast. The recreation room was cold (63.3 F) and the temperature stratification unusually small. The air flow rate from the three recreation room registers totaled 94 cfm, and that from the registers in the powder room and the two registers in the basement brought the total air flow rate in this area to 254 cfm. This is 22 percent of the total 1134 cfm air flow rate to the entire house. It appears the cool air delivered to the upper two levels has been collecting in the lower level rooms.

As further corroboration of this trend, the temperatures measured in the garage are interesting. The garage door was closed and there are no registers in this space. The air temperature was 72.4 F at the ceiling and 69.4 F at the floor.

Draperies, Furniture Affect Performance

For comparison, the temperature differences are shown in the following tabulation.

	Upper Level	Middle Level	Lower Level
Temperature - 60 in, level	73.9 10.2	76.4 13.1	63.3
Temperature difference, floor to 60 in, level *Temperatures are averages	7.7	9.5	1.3

No explanation for the wide temperature differences from the floor to the 60 in. level and to the ceilings can be found. However, the comments of the mobile laboratory technician and the photographs taken of the job indicate the very strong possibility of interference with the air delivery from the floor diffusers by the window draperies. It is also noted that in several instances relatively low furniture clearance, such as under beds and chairs, interfered with good air diffusion, Low furniture clearance over the registers and interference with air delivery by draperies would not necessarily have an adverse effect upon the performance of the system during the heating operation but could upset the cooling operation. The chilled air from the diffusers would not be projected upward to diffuse with the room air but would mushroom out along the floor from under the furniture and remain close to the floor.

Air Flow Calculations Agree

The measured air velocities from registers were used to estimate the air flow rate. The calculated air flow rate of 1134 cfm from the supply air registers agreed with the flow rate of 1102 cfm measured at the return air intakes. A flow rate of 1134 cfm corresponds to 378 cfm per ton of rated cooling capacity. The register air temperatures averaged about 52 F and did not vary significantly while the blower and compressor were in operation. The temperature of the air leaving the cooling coil was 50 F.

Two test measurements of return air temperatures showed 67.6 F at the dining room return and 65.4 F at the balcony return, an average of 66.5 F. The temperature difference between supply and return air at the registers was about 14.5 deg, which includes the duct heat gains. The temperature drop across the cooling coil was approximately 17.5 deg.

A tabulation of air supply, heat gains, return air and the average temperatures are given in the following table:

L	ower Level	Middle Level	Upper Level
Percent of total heat gain Percent of total supply air Average supply air tempera-	10.3 22.4	48.1 44.2	41.6 33.4
Average 60 in, level tem-	50.0	53.6	52.0
Percentage of return air	63.3	76.4	73.9

The middle level rooms have 48 percent of the total heat gain of the structure but receive only 44.2 percent of the total air supply. They also have the highest supply air temperatures and the highest room air temperatures at the 60 in. level. It appears that the deficiency in air flow rate along with the higher supply air temperatures are responsible for the higher average room air temperatures.

Upper Level Cooler Than Middle Level

The upper level rooms have 41.6 percent of the total heat gain but only 33.4 percent of the total air supply. The 52 F supply air temperature is lower than that supplied to the middle level. In spite of the insufficient air flow, the room air temperatures at the 60 in level aver-

BACKGROUND OF THESE REPORTS

A SERIES OF FIVE articles on heating split level houses was published in the June through October, 1956 issues of American Artisan. The articles were summarized from data obtained by the National Warm Air Heating and Air Conditioning Association's mobile laboratory and evaluated by the association's field committee. This series on cooling split-level homes presents information from the same sources. This is the third of four articles.

The results of the heating investigations indicate that the lowest level of the house is the hardest to heat and is thus the coolest part of the building during the heating season. On the other hand, the upper level is the easiest to provide with winter comfort. An analysis of the data secured by the mobile laboratory during the summer of 1955 shows that the most difficult level to heat is the easier to condition during the summer and that the easiest area to pro-

vide with winter comfort is the most difficult to condition in summer.

The problems uncovered by the field investigation committee are by no means unsolvable, and would, in several cases, never have existed had the designers of the systems used the information available in the association's manuals. It should be obvious that care must be taken in the design and installation of year 'round air conditioning systems in split-level houses.

age 73.9 F, which is lower than that of the middle level, probably partly due to the somewhat lower supply air temperature.

The lower level accounts for only 10 percent of the total heat gain, yet it receives 22.4 percent of the total air flow. The outlets in this level (which includes the basement area) are close to the cooling plenum and the average supply air temperature is 50 F. This is the coolest level of the house with a room air temperature of 63.3 F at the 60 in. level. This is probably due to the excessive air flow rate in relation to its portion of the total heat gain plus the fact that the coolest air is delivered to this level.

Returns Prevent Spillage to Middle Level

The return air registers from the upper level are in the floor of the balcony just in front of the ornamental iron railing. This arrangement effectively prevents air spillage from the upper to the middle level. The mobile laboratory technician could detect no unusual air movements in this area. However, this level provides 38.5 percent of the total return air — about 5 percent more than the supply air it receives.

The middle level receives 44.2 percent of the total supply air and the return air intakes handle 36.6 percent of the total. Even allowing that the 5 percent excess return air from the upper level is taken from the middle level, the intake of return air from this level is still deficient.

Cool Air Drifts to Lower Level

The lower level return air intakes account for 25 percent of the total, yet this level receives 22.4 percent of the supply air. This excess return air undoubtedly drifts down from the upper and middle level rooms. If this is the case the lower level rooms would be partially cooled by the air from the rooms above it. The low room air temperatures in the lower level are probably caused by:

- 1) Excessive amount of supply air.
- Excessive amount of return air, which pulls cool air from the rooms above.
 - 3) Low supply air temperatures.
 - 4) Natural drift of cool air from the rooms above.
 - 5) Cooling from the ducts on the lower level.

It seems the system is not properly balanced for even room air temperatures at all levels.

Minimum attic air temperatures occurred at night and the maximum temperatures were usually reached between 2 and 4 p.m.

The 131.5 F maximum attic air temperature reading was obtained when the sun was shining brightly and the outdoor air temperature was 97 F. Temperatures were measured in the attic over the living room about 48 in. above the floor. The sun intensity temperature was 115 F. Sun intensity temperatures are measured under a glass bowl exposed to continuous sunshine.

Downward Drift Isn't Noticeable

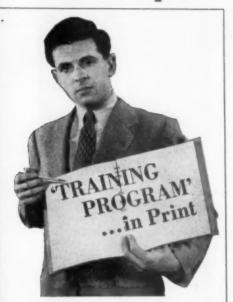
A special study was made of the air movements around the two return air intakes along the balcony railing and down the stairs from the balcony into the living room, to determine the amount of air drift from the upper level into the living room on the middle level, and to determine, if possible, the probability of objectionable drafts in the living room.

Measurements around the two return air intakes at 6, 12, 18, 28 and 40 in. above the floor showed that all air movement was toward the return air intake and none was observed spilling down into the living room over the balcony edge.

Cooling problems in a fourth test house will be discussed in the next article in this series of reports on tests in split-level residences.

Why Where How

To Install Outside Air Intake



THIS SERIES of articles, under the general heading, " 'TRAINING PROGRAM' . . . in Print," is designed to help dealers train their engineering, service, managerial and sales personnel in all phases of their operations. These articles are selected for their informative value and are presented as reference material for developing know-how among employes in situations which are likely to arise. Some of the previous articles in this series have discussed:

- electrical problems
- humidity control
- management techniques
- air distribution
- sales presentations
- school heating
- promotion ideas
- attic fans
- selling builders
- attention to details
- installation procedures
- fume removal systems
- cost estimating

Need for a source of outside air is multiplied in today's tightly constructed homes, in order to provide combustion air, odor control and moisture removal. Here are some methods and reasons for installing these intake ducts

By Frederick B. Morse, Purdue University

"WHY INSTALL an outside air intake in a heating system? The house is full of air!" Heating dealers may have heard similar exclamations from customers when they described the systems they proposed to install.

Actually, there are three reasons for installing an outside air intake:
1) to provide a source of oxygen for combustion; 2) for odor control in the house; 3) to control excess moisture in the living area.

True, the house is "full of air." But it's likely to be stale or stagnant air, which is not suitable for any of the three points listed above. Modern houses, in answer to demands from the heating dealer, general contractor, architect and home owner, are designed to minimize heat loss. Today, most quality houses have lap joint or tongue-and-groove insulated sheathing, blanket insulation in the side walls with nailing flanges stapled to the studs, storm doors, weatherstripped windows, and double glazed windows or storm sash throughout the structure. The result is a practically "air-tight" house. There just aren't enough cracks or openings these days for outdoor air to infiltrate into the house as fast as it is required.

Combustion Calls for Oxygen

Let's look into the three reasons for installing an outside air intake

in a heating system, beginning with combustion air, which is probably the most important from the standpoint of heating system performance.

The burning process requires oxygen, regardless of whether the fuel involved is gas, oil, coal or wood. It doesn't require an engineer to rule out artificial sources such as oxygen bottles stored in the basement or utility room to supply oxygen to the furnace, when nature provides an abundant supply, free for the taking, in the outdoor air. The simple solution is to bring this oxygen-bearing air into the furnace through a separate duct.

Outside Air Dilutes Odors

Odor control inside the house is essentially a matter of dilution of the odors by adding outdoor air. To control odors effectively, exhaust fans should be installed to expell stale air as the intake supplies outdoor air. These fans should be located to pick up odors at their source. When the exhaust fans are not running, air is forced out window and door cracks. provided the fresh air intake is properly sized and construction is not too tight. This leakage is ordinarily sufficient to keep the indoor air reasonably free from odor, provided kitchen and bathroom exhaust fans are used

In commercial or industrial ventilation 25 to 100 percent outdoor air is provided, depending on state codes and the type of occupancy. In the average residence, odors can us-

Here are some tested installations by different dealers



1 TYPICAL INTAKE is installed in basement window. Note condensation stains on duct



2 OPENING IS CUT into spare flue in chimney. Intake is located on screened porch



4 CHIMNEY WALL is cut out to accommodate a 12 × 24 in. louver connected to 12 × 12 in. flue liner



5 OVERHANG ABOVE garage doors conceals 16 × 8 in. grille which joins a 6 in. round duct



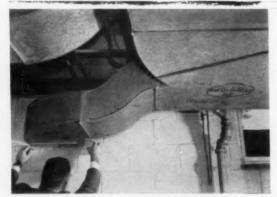
3 AIR VELOCITY at end of 4 in. intake in furnace room is noticeable. Duct is set into lower end of flue shown in Fig. 2



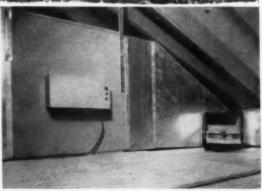
6 STONE SEAT doubles as outdoor air intake. Sleeve was set in concrete block wall



7 CROSS-CONNECTED 48 × 48 in. return air dampers regulate amount of air admitted to church



8 INTAKE DUCT runs from stone sea (Fig. 6) through sleeve set in concrete block wall and into return air duct ahead of filter chamber



9 ATTIC INTAKE and backdraft damper are installed ahead of electrostatic air cleaner in 2300 sq ft house with perimeter distribution and return air duct work located in attic



ually be controlled by about 10 percent outdoor air.

Winter Air Is Dry

Moisture is constantly being added to the air inside the home from kitchens, bathrooms, utility rooms and any occupied area (through ordinary breathing and perspiration, four people will release six quarts of water in a 24 hour period). Excessive moisture can cause all sorts of difficulties and discomfort. Condensation forms on storm sash, window panes or walls; upholstered furniture or shoes may mildew; outside paint might blister; and window sash and sills may rot.

During the cold winter months outside air that enters the house through an outdoor air intake is relatively dry and is thus capable of absorbing water vapor from the air in the house. Then, as air leaves the house through window and door cracks or is forced out openings by exhaust fans, the moisture content of the building is reduced. Most dealers know of cases where extreme moisture problems have been remedied by installing outdoor air intakes.

Three Methods of Sizing

As mentioned previously, the outdoor air intake must be properly sized in order to do the job. There are three ways to size the installation for the particular residence:

 Calculate the air quantity based on values from the Heating Ventilating Air Conditioning Guide.

TABLE 1—COMPARISON WITH ASHAE calculated method shows rule-of-thumb method of sizing air intake duct to be reasonably accurate

1	2		3			4		5			6
Line	House		Area of Outside Air Intake, Sq In.					Diameter of Round Outside Air Intake Duct			
			Calcu	lated	Mors	e's R	Rule	Calcu	lated	Morse	s Rule
Λ	X(nws)		76			76 .		10			10
В			45			42.6.					7
C		***************************************	97			99 .		10	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		10
D	Y(ws)	***************************************	66			67 .)		9
E	Z(nws)		60			67 .		***************************************			9
F	Z(ws)		2.5			37 .					7

- 2) Use a rule of thumb method.
- 3) Guess.

Method number three can be passed over with the observation that most estimates made by guesswork fall short and the intake is too small.

Obviously, the first method is the most accurate. It consists of calculating the air required for efficient combustion based on the fuel input to the furnace, then consulting the ASHAE Guide and the NWAHACA Manual No. 3 for the appropriate crack leakage data for windows and doors. Air quantities should be expressed in cfm and the fresh air intake sized to bring the total combustion and infiltration air into the return side of the furnace at 500 fpm.

Method 2 (a rule of thumb method known as Morse's Rule) is a quick way to estimate the ASHAE calculated area and yields acceptable results for average houses. For houses with double-hung wood sash having no weatherstripping on windows and doors the area of a fresh air intake is estimated as:

Area = (3W + D)/8in which area = free area of duct in sq in.; W = total lineal ft of window crack in house; D = total linealft of outside door crack in house.

For houses with double-hung wood sash and both windows and doors weatherstripped, the area of a fresh air intake is estimated as:

Area = (2W + D)/10

Table 1 is a comparison of the ASHAE calculated method and Morse's Rule for three houses.

The calculated areas for the three houses (lines A, C and E in column 3) are based on double hung wood sash windows of average fit and well fitted doors. The calculated areas of outside air intake ducts (column 3) for the three houses X,Y and Z (lines

B, D and F) are based on average double-hung wood sash windows and well-fitted doors which have been weatherstripped. Comparison of duct areas in columns 3 and 4 shows that the area for any given example is equal, or almost equal. Then if we compare the diameter of the round outside air intake duct that would be installed according to the Morse Rule and by the calculated method, we find the diameters are the same with but one exception, which is due to rounding off uneven numbers in the duct diameters. For example, a duct with an area of 45 sq in. is 7.6 in. in diameter, which we round up to 8

The Morse Rule is handy and gives an answer quickly, even when the total heat loss of the structure is unknown. It must be used with judgment, however. The heating dealer should check the Morse Rule by the ASHAE method on several jobs until he is familiar with the rule.

Three Sources of Air

Outside air intakes are not difficult to install. The basic idea is to pick up outside air and transport it to the blower chamber just ahead of the filters. There are three places to get outside air: through a vented attic, from an open crawl space, or through a basement wall above grade. The dealer's selection of source and location will be based on convenience for connection into the return air system ahead of the filters and fan.

Illustrations on page 56 show how various heating dealers have installed outdoor air intakes. Some are rather intricate; the majority are simple, but effective in contributing to the overall comfort which should be inherent in warm air heating.



INTEREST IN SHEET PLASTIC materials ran high. Contractors (l to r) R. K. de l'Etoile, E. B. Brown, III, and Richard Budde discuss merits of plastic fittings

SMACNA Sees Bright Future For Sheet Metal Contractors

business conditions, with proper planning and taking advantage of new ideas and procedures presented at the annual convention in Chicago last month. Here's a capsule report, broken down by subject

A BRIGHT NEW FUTURE looms over the horizon for the sheet metal contractor who adjusts his operation to include the use of plastic materials for installations where they can best serve his customers. This was the opinion of a panel of sheet metal contractors who addressed delegates to the Sheet Metal and Air Conditioning Contractors' National Association annual convention in Chicago May 15-18. The program included forums, conferences, round table discussions and general business sessions dealing with modifications of the association's constitution, election of officers and directors, industrial sheet metal fabricating problems, warm air heating and cooling problems, labor relations, fabrication of specialty products, insurance plans for employers and key personnel,

contract pitfalls and activities of the association's special committees.

PLASTICS

The growing trend of plastic materials as a substitute for sheet metal work was pointed out by E. B. Brown III, Chicago, who moderated the panel on plastic material applications. Mr. Brown said 25 million pounds of sheet plastic materials was used in 1953; in 1957 it is expected that over 60 million pounds will be needed to answer the demand for this material. He also pointed out that sheet plastic material can be worked with the standard tools in any well equipped sheet metal shop. This material is best suited to solve problems of exhausting corrosive gases from manufacturing processes but is also very adaptable to flashing



OFFICERS (1 to r) Joseph D. Wilder, Clarence J. Meyer, Nat N. Leas and Walter F. Limbach discuss the year ahead

HERE'S NEW SLATE OF OFFICERS

Directing the association is a board of directors consisting of 21 contractors and an executive secretary, who are:

Nat N. Leas, Fresno, Calif., president

Walter F. Limbach, Pittsburgh, vice president

Clarence J. Meyer, Buffalo, treasurer

Joseph D. Wilder, Elgin, executive secretary

Robert L. Bayless, Phoenix L. Ray Brooks, Chattanooga M. T. Buckley, Wichita

G. R. Cummings, Meriden, Conn.

Robert Holming, Milwaukee R. K. de l'Etoile, Cambridge, Mass.

William A. Kuechenberg, Chicago

D. E. Mannen, Cleveland

J. Frank Park, Los Angeles William J. Perkinson, Chicago

Robert E. Peterson, Kansas City, Mo.

C. A. Pfahl, Akron

Steve C. Raymond, Coral Gables, Fla.

Dwight E. Shytle, Washington, D.C.

Charles W. Schmitt, Rochester, N. Y.

Francis A. Staten, Portland, Ore.

Wm. Van Genderen, Denver Gordon Waters, Rocky Mount, N. C.

Behind convention scenes . . .



ROOFING PROBLEMS are hashed out by Richard E. Walsh, Herman Hertzer and George Ballard, Sr., during break in program



PLASTIC MATERIALS and their use for corrosive applications were investigated by (1 to r) E. B. Brown, III, L. Ray Brooks, William J. Griffin and Robert Holming



JURISDICTIONAL ASSIGNMENT of work is discussed by (1 to r) Paul Stromberg, R. S. Felhaber and William A. Kuechenberg



INTER-CITY PROBLEMS are aired out by (1 to r) Walter E. Keist, W. F. Kisne, Merle M. Daily and N. J. Biddle



FABRICATING TECHNIQUES for sheet metal are reviewed by (1 to r) Theodore Sohn, William J. Perkinson, and William Magerstaedt



CONVENTION COMMITTEE members hold an impromptu meeting; (I to r) W. H. Brackett, Ned Brown and Louis L. Narowetz

CONSTITUTION CHANGES

AMENDMENTS TO the constitution were acted upon by those attending the convention. Two major alterations made are:

A change in the method of paying dues whereby each member would pay \$5 annually for each productive employee. Minimum dues are to be \$25 annually; maximum dues are set at \$500. A productive employee was defined as either a journeyman, apprentice, foreman or superintendent.

An optional method of paying dues was offered to chapters of the association wherein chapters with 26 or more members could pay their dues in the manner described above or at the rate of \$50 annually for each chapter member.

2 The method of electing officers was changed to enlarge the board of directors to a total of 21 members. This body would consist of four groups of five directors and the immediate past president. Each group of directors would serve a four-year term, each group's term expiring in a different year. The board of directors will elect members from within its own body to fill the offices of president, vice president and treasurer. To assure equal representation from all areas, five geographical regions were created, with a director to be elected from each.

and coping work, gutters and downspouts, and gravel stops, he said.

Supporting the use of plastic materials, R. K. de l'Etoile, Cambridge, Mass., said cost of material would be about equal to the cost of most grades of 22 ga stainless steels, but under present fabricating techniques the installed job would cost about 15 percent more. However, he pointed out that scrap saving should be considered in the final cost of the job. There is practically no loss as far as scrap is concerned because the unused odds and ends can be sold to the plastics material manufacturer for reheating and rerolling.

Welding procedures for plastic joints were outlined by Charles Angel, Chicago, who described the cold method of joining sections of plastic material together. He said that tests have shown that once the joint has completely dried (about 40 minutes) the sheet material will rupture before the joint will fail.

HEATING-COOLING

The heating and cooling forum consisted of dealers Dee Cramer, Flint, Mich., who acted as moderator; Walter Keist, Pittsburgh; Lee Wagener, Peoria; Bernard Lawrence, Greenville, Pa.; C. A. Pfahl, Akron; and Jack Demling, association assistant executive secretary. Walter Keist compared the skills of the heating and cooling technicians to those of other professional people such as physicians, attorneys, and architects. He said the heating and cooling in-

dustry can give the public a guaranteed year 'round system that will provide healthy and comfortable atmospheres because of the high degree of training available to dealers.

SERVICE

Malfunctions in heating equipment can be reduced to a minimum, according to Lee Wagener, who recommended that dealers use annual service policies to sell preventive maintenance to their customers. He said annual service policies can mean the difference between profit and loss for the service department by the end of the year, and that service policies make it possible to schedule servicemen more effectively.

CODES

The advantage of codes and licensing for heating and cooling dealers was underlined by Bernard Lawrence, who said, "No code is any better than its local enforcement." He believes lending institutions should require that the heating system fully comply with the law as set forth under codes and licensing ordinances before making money available to build or remodel houses.

The National Fire Protection Association will make available a revised edition of Manual 90 by the end of June, according to C. A. Pfahl, who suggested that dealers in every part of the country obtain a copy of this new edition and install their heating systems according to its recommendations.

INSURANCE

Products liability insurance was reviewed by Jack Demling, who showed that insurance rates being paid by dealers are too often based on an improper evaluation. As an example, he quoted a case where a dealer with a \$250,000 business volume was paying his entire premium based upon the service rate (the highest) instead of paying this rate only on the service dollar volume of \$12,000. The remainder of the business volume (\$238,000) should have been based on a rate equal to about 2/3 of the original rate.

Another service feature of SMACNA, a group life insurance policy for members of the association and their key personnel, was outlined by R. S. Felhaber, the association's attorney. Mr. Felhaber reported that several la ge insurance companies have been contacted regarding the proposed insurance program and each have contributed a number of helpful suggestions, among which is the recommendation that the policy limit be based on 1½ times the annual compensation of the insured, with a maximum benefit of \$40,000.

CERTIFIED HEATING

A number of the organized programs developed to promote warm air heating by various local groups and backed by SMACNA were outlined by members of a contractor panel on indoor comfort. Also moderated by Dee Cramer, the panel



NEW DIRECTORS include (1 to r) Dwight E. Shytle, D. E. Mannen and Charles W. Schmitt



WISCONSIN CONTINGENT, (1 to r) R. S. Schmieder, Al Olsen, Walter Marth, Roland Biersach and Mike Poja, get together to compare convention notes

was made up of Jack Demling; R. S. Schmieder, Milwaukee; Ray O'Hara, Cleveland; Nat N. Leas, Fresno, Calif.; John Bannocks, sitting in for R. E. Harkins, Los Angeles; Ralph Nicholas, Kansas City; and Ed Stahler, Chicago.

Jack Demling led off with a discussion of the goals and limitations of a certified heating program.

Ed Stahler outlined the plan used by the Air Conditioning Contractors' Alliance of Chicago, in which an unidentified committee from the association, accompanied by the secretary, inspects installations and complaints, then informs the installing dealer what corrections should be made.

In discussing the Kansas City certified program, Ralph Nicholas, executive secretary of the local association, outlined some prerequisites for setting up a successful program: 1) the budget must be healthy enough at the beginning to do a thorough job of introductory promotion; 2) builders and architects must be circularized thoroughly; 3) the program must produce enough profit to maintain a vigorous promotion schedule; 4) the industry must be healthy in the area to begin with; 5) dealers must be qualified to talk intelligently about the program; 6) salesmen must maintain the "quality, not price" theme in selling.

Nat. N. Leas described the northern California association's stamp plan and underlined the need for all-out participation by dealers, wholesalers and manufacturers. He reported that some manufacturers and utilities are matching the association's publicity expenditures,

and that \$34,000 will be spent on promotion this year. He described briefly the structure of the plan, which is built around a five man board and two alternates elected by the association. Dealers are in control of the activities, although manufacturers and wholesalers are represented.

John Bannocks described the southern California plan as almost identical to that of the northern group, and reported that 107 manufacturers and at least 1000 of the 1400 dealers who had installed one or more warm air heating systems in the area are participating.

The Cleveland certified heating program which was reported in detail in November, 1956 American Artisan was reviewed by Ray O'-Hara, who noted that the Cuyahoga county association's decision to switch promotion efforts from the builders to the public paid off in creating a demand which forced many builders to cooperate.

NEW ASSOCIATION

R. S. Schmieder assumed the dual role of delegate from the Milwaukee chapter and representative from NWAHACA, in urging dealers to stick to a straight line of consumer education in their advertising. He said the Milwaukee WHAM program was heralded by 13 full page newspaper ads in 1956 and six so far this year.

Mr. Schmieder's report on the NWAHACA position in the certified heating program led the meeting into a discussion of the advisability of forming a separate division on a national scale, made up of heating and cooling dealers, as recommended to the board of directors by the Council of Chapter Representatives. He recommended that both national associations expand their operations to create such an organization.

During the ensuing discussions, Nat N. Leas, Jack Demling and J. D. Wilder told the group the board of directors must have expression of the actual needs from warm air heating dealers before the association can begin to determine the feasability of setting up a new division. Mr. Demling asked heating and cooling dealers to advise the association what it could do for them that it hadn't already done. Mr. Wilder invited dealers to arrange to meet with SMACNA representatives in various central locations to discuss the necessity of the proposed venture.

APPRENTICESHIP

Results of the annual National Joint Apprenticeship Contest were announced by Frank Kramer, Milwaukee contractor. Winners are: Herman W. Jutz, Jacklin Heating and Sheet Metal Works, Milwaukee, first place; Nicholas S. Maile, Englehaupt and Co., Buffalo, second place; Charles Alberts, Alberts Sheet Metal Works, Atchison, Kans., third place. Honorable mention went to Jerry Neff, Olympia Roofing Co., Inc., New Orleans.

For the best apprenticeship training program, a plaque was awarded the Detroit Sheet Metal Joint Apprenticeship Committee. David M. Todd, Kansas City contractor, made the presentation. Honorable mention was awarded the Parkersburg, W. Va. Joint Apprenticeship Committee.



HENRY PUCIATO uses manufacturer's literature to illustrate sales story. He leaves if prospect has not purchased within 15 minutes

With a single call . . .

♦ ♦ he sells

and installs



This dealer has developed a one call door-to-door campaign to boost business during the off season by selling furnace humidifiers. When a prospect is sold, he makes the installation immediately.

Door-to-Door Humidifier Sales Make 'Slack Season' Profitable

As an experiment, a New Jersey dealer conducted a carefully planned door-to-door selling campaign and increased his volume by \$2500 during the recent winter slow season. During October, November, December and January, Henry Puciato sold about 100 automatic furnace humidifiers.

"I'd read a lot about the way dry air in homes without proper humidification promotes colds and allergies," said Mr. Puciato, Pennsauken, N. J., dealer, "and how proper humidification would help people avoid such trouble. This struck me as an excellent sales appeal, so I set out to see if I could sell furnace humidifiers and make it pay."

To begin with, Mr. Puciato realized that the best way to get quick sales results was to sell "the most logical prospects" first. Before he knocked on the first door Mr. Puciato calculated what his sales results would have to be in order to make it worth his while. He estimated that in two hours he could make five to seven calls, and felt that if he could sell two humidifiers during an evening the business would be worthwhile. His average was ac-

tually slightly better, coming to about eight sales per each six hours worked, usually three evenings per week.

Chose His Sales Target

Mr. Puciato next looked for the heaviest concentrations of likely prospects in his area — suburban Philadelphia and Camden, N.J. He chose as a sales target the veterans housing developments built shortly after World War II. Most of these houses are in the middle and lower price class with forced air heating, but without humidifiers. They also lie within a 25-mile drive of downtown Philadelphia, so that Mr. Puciato would waste no time or mileage getting "on location."

Most important, Mr. Puciato felt that in these tracts he would be calling on families with young children, and the health appeal would be particularly strong.

Information furnished in manufacturers' mailing stuffers seemed complete enough to be the basis of his sales story, so with a quantity of them in hand, Mr. Puciato began ringing doorbells.



AFTER PRACTICE, Mr. Puciato has found that he can make an installation in about 10 minutes. Immediate installation cuts cost, permits lower price

"I started off speaking to the man of the house, if possible," says Mr. Puciato, "because he always has some mechanical interests. I'd ask first of all whether his heating system was equipped with a humidifier, and then whether I might take a minute to explain the health and property protection available from humidifiers. I got to the health angle right away, because I felt it was the most important interest of the prospect."

Once Mr. Puciato established these two qualifications, and had received an invitation to enter the house, he made sure that he and the prospect were seated and comfortable, then launched into the main sales story.

"I explain that dry air helps promote colds," he says. "When the air inside a home is dry the nose and throat can become dry and irritated and susceptible to airborne infections. Research shows that flu germs die more rapidly as the relative humidity is increased. Humidified air also is real protection to the health and beauty of a housewife's skin and hair. I back these statements up by showing the documentation printed in the manufacturer's literature which I leave with the prospect later."

Shows How It Operates

At this point Mr. Puciato demonstrates the mechanical operation of the humidifier. He carries a demonstration unit with him in an open carton on each call. He shows the prospect how easily the humidifier can be installed and adjusted. Step-by-step photographs in the instruction sheet help him make these points clear. He also points out the written gurantee card included with the humidifier, to build assurance with the prospect.

Then Mr. Puciato goes on to describe how proper humidity protects household furnishings. Again he uses the envelope stuffer to verify his statements that upholstery and fabrics wear longer in humidified air, that it maintains the strength of furniture glue and that books and papers are protected from "shelf" wear.

Says Mr. Puciato, "Usually by this time folks are interested. I rarely miss a sale, if I have gotten this far in my story." However, if he hasn't closed in 15 minutes,

he has found that it pays to move on to the next house.

To save travel time, Mr. Puciato likes to sell and install on the same call. He also has found that homeowners prefer it in most cases. Therefore, when he closes a sale, he stops being a salesman and becomes a mechanic, going immediately to the basement to do the installation, if it is convenient for the homeowner.

Can Install in 10 Minutes

As his skill has increased, Mr. Puciato has found that he can easily complete an installation in about ten minutes, since the humidifier is factory-assembled, a plenumcutting template is provided and the unit is equipped with ten feet of plastic water-tubing that connects without tools. The extra-length tubing eliminates running out to the car for a longer piece, and lets Mr. Puciato pick a conveniently located spot to tap into the cold-water line. He keeps a neat and "salesman-like" appearance by slipping on a shop-coat before going to work.

Because of his low package price for the job, most homeowners are ready to pay cash on the spot. With those who don't, Mr. Puciato has had very little credit trouble, accepting a small down-payment to close the sale. Of course, it is to his advantage to keep bookkeeping at a minimum.

Where installations are delayed, Mr. Puciato and an assistant complete them on weekends. In some cases the homeowner feels he is competent enough to make the installation himself, and Mr. Paciato cooperates, feeling that the more humidifiers installed in a neighborhood the better his chances of word-of-mouth referrals. By the end of his first season, 30 to 50 percent of his humidifier business was coming from referrals.

Builds Address List from Sales

With an eye on repeat business, Mr. Puciato is careful on each sale to fill out the guarantee card, which he mails to the customer after taking the name and address for his own list. Mr. Puciato intends to add a evaporator plate replacement and humidifier-cleaning service to his operation, figuring that with the same streamlined tactics he has used in selling, he can increase his service volume in August and September.

What does Mr. Puciato think of the humidifier business after his first season? He says, "I purposely kept my operation down this first year. Now that it's over I'm convinced that the potential is there. This year I was charging the manufacturer's suggested retail price which I will continue to do, since the normal dealer's margin will cover my overhead and selling expenses and give me a good profit. However, I will have to increase my installation fee over the \$10 I've been charging if I put on installation crews."

Mr. Puciato feels that carefully controlled specialty selling, plus an easily installed humidifier can add up to profits and desirable extra volume for any dealer who makes a truly business-like approach.



Technical
Conference
looks into the
future of
air conditioning

Industry's Questions Are

. . . at the annual NWAHACA Technical Conference

future and exchanged ideas on air cleaning, system design,

INFORMATION THAT WILL pave the way for better air conditioning systems of the future was presented to 182 representatives of the industry at the second Technical Conference of the National Warm Air Heating and Air Conditioning Association in Cleveland, May 1 and 2. Subjects covered methods of cleaning air as it flows through the air conditioning system, sound control for air condi-

tioning systems, refrigerant flow control devices, attic ventilation and its effect on heat gain, how to solve humidity problems, cooling the second floor in residences, climate and its effect on people, and basic design for the system of the future to fit the house of the future.

Research now underway but geared for future needs, and the effect of this research on the warm air heating industry was described by F. L. Meyer, association president, and president of Meyer Furnace Co. He said, "To be truly effective for the future, research work must be out ahead of current practices and problems of the industry. Research activities are now dealing with problems and practices of five, ten and even 20 years from now so that when the industry gets to that point, the needed information will be available.

"New homes of the future will depart from traditional design, construction and materials. We, in this conference, are taking the steps necessary to free research workers to develop systems, methods and practices compatible with the new designs, construction and materials which will be found in the structures of the future.

"The future belongs to those who truly believe that there is a future and who, accordingly, prepare for it."

The program was divided into four technical sessions, each presided over by one of the association's research



WHAT THE FUTURE HOLDS for the industry is considered by (1 to r) F. J. Nunlist, Jr.; F. L. Meyer and W. H. Scheick



Answered by Those Who Know

in Cleveland May 1-2 where specialists looked into the improved products and construction trends

committee members. Moderators were: Frank J. Nunlist, Jr., executive vice president, Mueller Climatrol Div., Worthington Corp.; S. C. Marshall, manager, Sales Engineering Residential Div., Minneapolis-Honeywell Regulator Co.; D. R. Bahnfleth, research associate, University of Illinois; and W. E. Hood, director of engineering, Unitary Equipment Div., Carrier Corp.

Speakers who addressed the audience on specific subjects made the following comments on various pertinent subjects:

System Design

- S. Konzo, professor of mechanical engineering, University of Illinois —
- It appears that the cooling requirements for second story rooms demand the installation of extra ducts and registers in addition to those required for heating.
- Reductions in the heat gain to
 second story rooms, by use of 6
 or 8 in. of ceiling insulation or awnings, will lessen the need for provid-

ing extra duct capacity to the second story for summer cooling.

- Inasmuch as gravity effects increase when the air from the
 register does not diffuse promptly
 with the room air, it appears logical
 that care must be exercised in the
 selection of the type of register and
 the register velocity to diffuse the air
 sufficiently as it leaves the register.
- D. R. Babnfleth, research associate in mechanical engineering, University of Illinois —
- Forced attic ventilation at a 1560 ofm rate caused a reduction of about 49 percent in the sensible cooling load imposed by the ceiling of a test house. Since the cooling load imposed by the ceiling was but a portion of the total cooling load, the ventilation air flow rate of 1560 cfm resulted in only an 8 percent reduction of the total load.
- Research tests showed that an increase in the attic ventilation rate caused a decrease in the number of hours of attic fan operation for any given weather condition. On a



MODERATOR W. E. Hood (left) goes over presentation outline with speakers G. F. Landgraf and D. O. Bender (right)

design day the fan operated 18, 15.4 and 12.5 hours with air-flow rates of 625, 1030, and 1560 standard cfm, respectively. Thus, although the electrical input to the fan increased with each increase in air flow rate, the daily operating cost of the fan did not increase proportionately.

- Robert J. Waalkes, application engineer, Hart & Cooley Manufacturing Co. —
- Development and maintenance of the new technical data manual will provide the information needed to develop systems which will meet the needs of new building designs and trends.
- Extensive research in methods

 of joining duct sections and fit-

Corner discussion topics run the gamut following



DESIGN OF COOLING system is discussed by (1 to r) W. W. Morrisey, Ira Metcalf and S. Konzo



DISTRIBUTION PATTERNS of air from diffusers are traced by (1 to r) J. R. Wright, Harold Straub and D. R. Bahnfleth



AIR CLEANING methods are discussed by (1 to r) E. H. Evans, L. H. Gary and E. W. Gettinger



SOUND CONTROL measurement and methods of solving noise problems are deliberated by (1 to r) P. T. Holtkamp, Warren Blazier and Jim Yund

tings has made it possible to install air distribution systems with lower friction loss than has been possible in the past. This information becomes more important as system characteristics change.

Operating Costs

Ralph A. Gonzales, director of technical service, Airtemp Div., Chrysler Corp. —

Significant differences in the heat gain of various houses with the same floor areas are due to variations in construction, insulation, amount of glass, orientation and shading.

Differences in cooling capacities of mechanical equipment and corresponding power consumptions can be magnified by installation methods.

The manner in which different home owners operate their equipment has a definite effect on operating costs.

H. C. S. Thom, chief climatologist, president's advisory committee on weather control —

The fact that climatic conditions

are the main reason that air
conditioning is required make it reasonable to expect that variations in
climate and weather conditions must

be the main factors in operating costs.

"Sentient temperature" is defined as a temperature which consists of the dry bulb temperature plus an additional number of degrees which measure the effect of humidity.

Air Cleaning

E. M. Evans, technical director, Amer-glas Div., American Air Filter Co. —

The charged-media electrostatic
air cleaner utilizes both mechanical and electrical forces in removing
dirt particles from the air. One grid

each of the organized sessions . . .



OPERATING COST DATA is presented to Victor Fahringer (left) and J. F. Drumm by Ralph A. Gonzalez



HUMIDITY AND WEATHER problems are reviewed by (1 to r) H. C. S. Thom, S. C. Marshall and S. C. Hite



REFRIGERANT CONTROL applications are reviewed by (1 to r) John A. Schenk, E. P. Mikol and Bert Leininger



FUTURE SYSTEM DESIGN is predicted by Robert J. Waalkes (right) to Otmar E. Teichmann (left) and Frank W. Bennett

of the pleated media is charged to a high voltage potential while the opposite grid is electrically grounded; producing a highly stressed electrical field. The individual fibers composing the filtering media are at different voltages, ranging from zero to 3000 volts, and the potential of each fiber is different from that of its neighbors. The result is an electrostatic field of force between the adjacent and converging fibers, and extending into the free spaces between the fibers.

The effect of the electrostatic charge set up in charged-media air cleaners is to collect small, micron-size dust particles that would normally escape the impingement filtering action within uncharged media. This combined mechanicalelectrostatic air cleaning results in the removal of fine dust and smoke particles.

Dale O. Bender, chief sales engineer, Research Products Corp. —

Impingement filters do not strain dirt from the air. Rather, they are similar to low velocity centrifuges, for the air, as it passes through the multiple layers, changes direction frequently and suddenly. The dust particles impinge on the metal baffles or fiber strands which are coated with oily adhesives and retained.

Generally speaking, panel-type filters are very effective on lint and on impurities about 10 microns in size. With smaller impurities, their effectiveness diminishes. For that reason they are not exceptionally effective on fumes, gases and vapors. They are effective, however, in removing pollen which is well above the 10 micron size.

George F. Landgraf, vice president in charge of engineering and research, Trion, Inc. —

The full importance of air pollution and its relationship to human welfare was not generally realized until the past decade when municipal, state, and federal gov-

Air Conditioning is "A Sure Bet" in House of Future

ernments began to study the problem seriously and to enact some sort of effective smoke control legislation.

The type and size of an electrostatic filter for any given application depends on the efficiency requirements. For ordinary ventilation purposes, removal of 90 percent of all airborne dust is considered practical.

Sound Control

Warren Blazier, research engineer, Coleman Co., Inc. —

- The most acute noise problem in residential heating or cooling installations today is a result of the commonly used, cost-saving, throughthe-wall short return air duct. Even potentially quiet equipment is severely penalized in installations of this type. The noise on the discharge side of the system is something over which we have more control. It certainly does not represent a problem of the same magnitude as the short return.
- Residential noise control must reduce the annoyance level of sound to be effective. The most recent newcomer in terminology pertaining to evaluation of sounds is the "sone." For certain purposes, the sone a calculated value for the loudness of sound is a very useful term.

Humidity

- S. C. Hite, professor, department of chemical engineering, University of Kentucky —
- A list of moisture sources will show that most of the serious contributors to condensation are located in the kitchen, bathroom and utility room or basement of the house. Since the bathroom is usually constructed to withstand moisture condensation, the kitchen then becomes the most important location for a residential ventilation system.

A mechanical exhaust system in which the air intake was located in the bottom of a cabinet above the stove and a 5 in, hood was installed at the lower front corner of the cabinet was a most effective method of removing excessive moisture created by cooking activities in the kitchen.

Refrigerant Controls

John A. Schenk, director of engineering, Alco Valve Co. —

- A thermostatic expansion valve may be called an evaporator superheat control valve because it controls the superheat of the refrigerant gas leaving the evaporator. The valve provides efficient operation of the evaporator under a variable load condition and also provides protection against the return of liquid refrigerant to the compressor.
- "Hunting" of a thermostatic expansion valve can be defined as the alternate overfeeding and starving of the refrigerant flow to the evaporator. Hunting can be minimized, eliminated, or avoided by good evaporator design, good thermostatic expansion valve design, selection of proper valve size and type of power assembly charge, correct application of the remote bulb and external equalizer line, and correct arrangement of the suction piping.

Edward P. Mikol, senior research engineer, Carrier Corp. —

- Capillary tubes as refrigerant control devices should be limited to factory-assembled hermetic units where careful control can be maintained over system cleanliness, evacuation, dehydration and refrigerant charging and should not be used as replacements for equipment designed for use with other types of refrigerant control devices.
- Performance of capillary tubes seldom deteriorates with properly designed equipment. When it does

occur it is usually of short duration during peak periods of the hottest days.

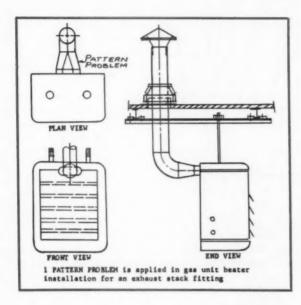
House of the Future

William H. Scheick, executive director, Building Research Institute —

- The next 25 years will see changes in houses far greater than ever before. The forces for change, perhaps even revolutionary change, are even now shaping up.
- New industries will make strong bids to capture major shares of the market for housing products notably the chemicals, electronics, and metals industries. These industries know how to achieve change through research.
- The home building industry proper will move farther and farther into mass production techniques and factory assembly of major components of houses.
- In the house of the future, year 'round air conditioning looks like a sure bet considering the standards of comfort demanded by the public. Panels will be built to include integral duct spaces for air distribution. The well-insulated shell will permit the use of relatively small air conditioning plants.
- The designer will not want the mechanical unit to occupy valuable floor space, nor to be so positioned in the plan as to interfere with rearrangement of space units within the house. Evidently the air conditioner will have to be above or below and outside the living space. Wherever it is, it must be an accessible unit.
- In meeting the requirements of tomorrow's families, the industry will shoot for 2000 sq ft of living space for the middle income market.

The meeting was marked by interesting questions from the audiences and authoritative replies by panel members and speakers.

How to Make an Oval To Round Fitting



THE SUBJECT which inspired this month's pattern problem is part of a gas heater exhaust stack.

In the design of natural draft vent stacks, some of the recommended rules are as follows:

The vent should extend high enough above the building or other neighboring obstruction so wind from any direction will not strike the vent from an angle above horizontal. The vent stack should extend a minimum of 2 ft above a flat roof and 2 ft above the highest part of wall parapets and peaked roofs within 30 ft to be reasonably free from down drafts.

The vent stack should have a cross sectional area not less than the flue collar of the manufacturer's equipment.

No manually operated damper should be placed in any vent stack.

Given the plan and front views of an oval to round fitting, the following is a step-by-step analysis of the pattern problem solution:

Simplified Method Drawing, Fig. 3 —

a) Draw a vertical center line and establish point A. From A, measure up the given 2½ in. vertical height as . . . using the simplified method to lay out a practical exhaust stack fitting

shown on the front view (Fig. 2B) and mark the point 1. From points A and 1, draw lines to the right of and perpendicular to the center line.

b) From point 1, measure the given 1 in. radius and mark the point 4. From A, measure the 3/4 in. flat and 3/4 in. radius dimensions as shown on Fig. 2A, and mark the points B and E.

c) With point 1 as center and radius 1-4, draw a quarter circle above line 1-4. Divide the quarter circle into 3 equal spaces and number the points 1', 2' and 3'. From the three points, draw lines perpendicular to and intersecting line 1-4. Mark the intersection points of the perpendicular lines on line 1-4 with the numbers 2 and 3. With point B as center, and a 3/4 in. radius, draw a quarter circle below line BE. Measure 3/4 in. below point A and establish point A'. Draw the line A'B' tangent to the quarter circle. Mark line A'A as distance Z. Divide the 3/4 in. radius quarter circle into 3 equal spaces and mark the points B', C' and D'. From points B', C' and D' draw lines perpendicular to and intersecting line AE. The intersecting points are B, C and D.

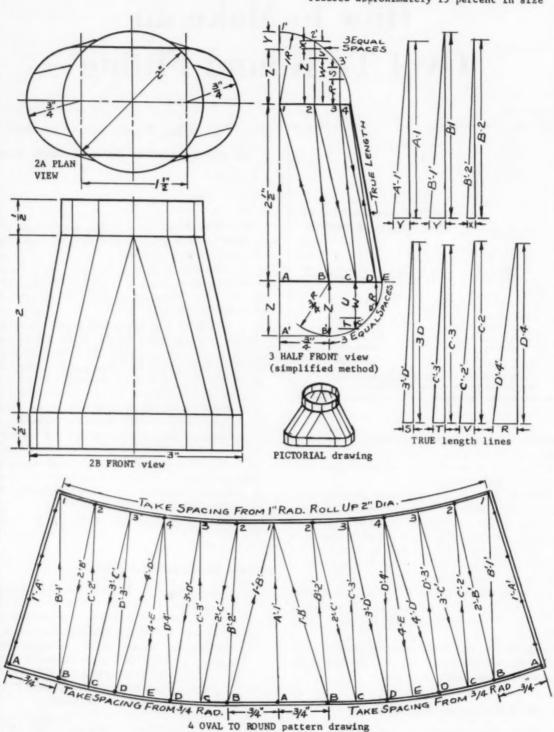
d) Draw the work lines 1B, B2, 2C, C3, 3D, D4 and 4E.

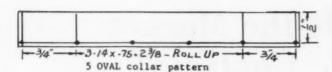
Oval to Round Pattern, Fig. 4 -

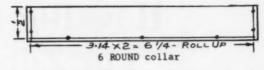
a) Draw a right angle. Working from Fig. 3, subtract line AA' (marked Z) from line 1-1' on the round end, and mark the difference in lengths with the letter Y. Transfer distance Y from Fig. 3 to the horizontal leg of the right angle, and transfer the $2\frac{1}{2}$ in. height shown on Fig. 2B to the vertical leg. The hypotenuse line A'1' is the developed line. Draw the vertical line A'1' (Fig. 4) which is equal in length to the developed line A'1', and mark the lower point A and the upper point 1.

b) Transfer line B-1 from Fig. 3 to the vertical leg of a right angle. The difference in length of line BB' on the oval end and line 1-1' on the round end, marked Y

Note: Drawings on these pages have been reduced approximately 15 percent in size







(Fig. 3), is transferred to the horizontal leg. The hypotenuse B'1' is the developed line. With point 1 (Fig. 4) as center and radius B'1', draw arcs to the right and left of point A. With the 3/4 in. line A'B' (Fig. 3) as radius and point A (Fig. 4) as center, cut the arcs B-1, and mark both points B.

- c) Subtract line BB' (distance Z) at the lower end of Fig. 3 from line 2-2' at the top and mark the difference in length with the letter X as shown. Transfer line B2 (Fig. 3) to the vertical leg of a right angle and length difference X to the horizontal leg. The hypotenuse B'2' is the developed line. With points B (Fig. 4) as centers and radius B'2, draw arcs to the right and left of points 1. With arc length 1'2' on the quarter circle (Fig. 3) as radius and point 1 (Fig. 4) as center, cut arcs B'2', and mark the points 2.
- d) Subtract line CC' on the lower end of Fig. 3 from line 2-2' at the upper end and mark the difference in lengths with the letter V. Transfer line 2C from Fig. 3 to the vertical leg of a right angle, and length difference V to the horizontal leg; the hypotenuse line C'2' is the developed line. With points 2 (Fig. 4) as centers, and radius C'2' draw arcs to the right and left of points B. With arc length B'C' (Fig. 3) as radius and points 2 (Fig. 4) as centers, cut the arcs C'2' and mark the points C.
- e) Line 3-3' on the upper quarter circle is subtracted from line CC' on the lower quarter circle (Fig. 3). The difference in lengths, marked T, is transferred to the horizontal leg of a right angle. The line C3 is transferred from Fig. 3 to the vertical leg of the triangle. The hypotenuse C'3' is the developed line. With points C (Fig. 4) as centers and radius C'3', draw arcs to the right and left of points 2. Set a compass at arc length 2'-3' (Fig. 3) and with points 2 (Fig. 4) as centers, cut the arcs C'3' and mark the points 3.
- f) Transfer line 3D from Fig. 3 to the vertical leg of a right angle. Subtract line DD' on the lower quarter circle from line 3-3' on the upper quarter circle, and transfer the difference in lengths, marked S, to the horizontal leg. The hypotenuse 3'D' is the developed line. With points 3 (Fig. 4) as centers and radius 3'D', draw arcs to the right and left of points C. With a compass, measure arc C'D' on the lower quarter circle, (Fig. 3) and with points C (Fig. 4) as centers, cut the arcs 3'D', and mark the points D.
- g) Transfer line D4 from Fig. 3 to the vertical leg of a right angle, and line DD', marked R, on the quarter circle (Fig. 3), to the horizontal leg. The hypotenuse line D'4' is the developed line. With points D (Fig. 4) as centers and radius D'4', draw arcs to the right and left of points 3. With arc length 3'-4 on the upper quarter circle (Fig. 3) as radius and points 3 (Fig. 4) as centers,

cut the arcs D'4', and mark the developed points 4.

- h) Set a compass at line length 4E (Fig. 3) and with points 4 (Fig. 4) as centers, draw arcs to the right and left of points D. With arc length D'E (Fig. 3) as radius and points D (Fig. 4) as centers, cut the arcs 4-E, and mark the points E.
- i) Use the true length line D'4' (hypotenuse line D'4' was developed previously) and with points 4 (Fig. 4) as centers, draw arcs to the right and left of points E. With equal space ED' (Fig. 3) as radius and points E (Fig. 4) as centers, cut the arcs D'4'; mark the points D.
- j) Set a compass at hypotenuse line length 3'D', and with points D (Fig. 4) as centers, draw arcs to the right and left of points 4. With equal space 4-3' (Fig. 3) as radius, and points 4 (Fig. 4) as centers, cut arcs 3'D'; mark the points 3.
- k) With hypotenuse line length C'3' as radius and points 3 (Fig. 4) as centers, draw arcs to the right and left of points D. With arc length D'C' (Fig. 3) as radius and points D (Fig. 4) as centers, cut arcs 3'C'; mark the points C.
- 1) Measure hypotenuse line C'2' with a compass and with points C (Fig. 4) as centers, draw arcs to the right and left of points 3. Measure arc length 3'-2' (Fig. 3) and with points 3 (Fig. 4) as centers, cut arcs C'2' and mark the points 2.
- m) With hypotenuse line B'2' as radius and points 2 (Fig. 4) as centers, draw lines to the right and left of points C. With arc length C'B' (Fig. 3) as radius and points C (Fig. 4) as centers, cut arcs B'2', and mark the points B.
- n) Set a compass at hypotenuse length B'1', and with points B (Fig. 4) as centers, draw arcs to the right and left of points 2. With arc length 1'2' (Fig. 3) as radius and points 2 (Fig. 4) as centers, cut arcs B'1'; mark the points 1.
- o) With hypotenuse line length A'1' as radius and points 1 (Fig. 4) as centers, draw arcs to the right and left of points B. With 3/4 in. length B'A' (Fig. 3) as radius and points B (Fig. 4) as centers, cut arcs A'1' and mark the points A.

To Lay Out Collar Patterns, Figs. 5 and 6 -

To calculate the circumference for the large and small collars, multiply the given diameters by the constant 3.14. Thus, the circumference for the round collar is 3.14×2 or $6\frac{1}{4}$ in., and for the oval collar is $(3.14 \times 0.75 + 0.75 + 0.75) \times 2 = 7\frac{3}{4}$ in. Draw rectangles equal to the circumference by the given $\frac{1}{2}$ in. collar length.

Add allowances for seams and joints, lay out the necessary rivet holes, and mark the patterns for fabrication.

How Big Is the Market For Zone Controls?



SURVEY REVEALS an average of 20 percent of the new homes require zone controls for comfort, but the percentage varies according to region

STUDIES MADE by the field investigation committee of the National Warm Air Heating and Air Conditioning Association have found that current trends in home design and construction frequently create heating and cooling problems. In many modern homes these problems are not being solved and as a result the occupants are uncomfortable.

Because of these changes in house construction, the use of larger glass areas, spread out floor plans, split levels, rooms over garages or exposed spaces, basement occupancy, and the different requirements of sleeping and living areas, it is impossible to maintain good comfort conditions in many homes without two or more thermostats.

Saw Need For Survey

Since tomorrow's homes are planned today, the field investigation committee saw a need for a close look at the future. We felt it would be valuable to determine the probable number of homes to be built in 1957 that would require zone controls to maintain proper comfort standards.

However, a survey of this type would have been beyond the scope of the committee's normal activities. Furthermore, we were reluctant to ask for an additional appropriation for such a study. Since my own company has an understandable interest in my activities on the committee, I was bold enough to suggest such a study to them. They agreed to make it and the survey was begun.

So far, some 1550 new houses have been examined in seven major cities. The homes chosen represented a broad range of housing and climatic characteristics. In addition, a special survey of 184 houses was made on Long

Homes to be built this year will require some 200,000 additional thermostats to set up zone controls if minimum comfort standards are to be maintained. C. W. Nessell cites survey revealing size of market and factors influencing it

Island and another is underway at this time on the West Coast.

Since it was impossible to examine the houses to be built six months to a year in the future, we studied those currently under construction and assumed that they would be typical of those to come in 1957. The survey was limited to single family homes priced above \$10,000.

Engineers and market analysts who know and understand the problems of heating and cooling conducted the survey. They sought answers to two questions:

1) Will this house be comfortable with a single thermostat?

2) If not, why not?

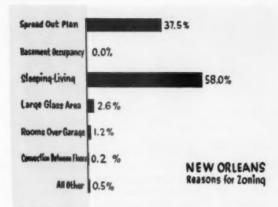
The results of the survey show that approximately 20 percent of these homes should have two or more thermostats for the maintenance of minimum comfort. Based on current estimates of the number of new homes that will be constructed in 1957, the findings indicate that at least 165,000 homes will require zone controls.

The survey did not attempt to discover how many homes would require more than two thermostats. But it would appear that by a conservative estimate a total of 200,000 additional thermostats will be required for minimum comfort conditions.

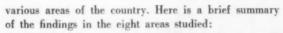
Reasons for Zones Differ

While the proportion of homes requiring two or more thermostats averages almost 20 percent, the reasons why the additional thermostats are required differs in the

[[]Note: Last of a series of three articles taken from an address by C. W. Nessell, beating industry consultant, Minneapolis-Honeywell Regulator Co., at the annual convention of the National Warm Air Heating and Air Conditioning Association.]



ZONES WERE required by the different needs of sleeping and living areas in New Orleans



 In Atlanta, where 15 percent of the homes would be uncomfortable with a single thermostat, basement occupancy was the major reason. Spread out floor plans, the requirements of both heating and air conditioning, and convection between levels were also important factors.

2) In Boston it was found that 23 percent of the homes would require two or more thermostats. Of this group, 33 percent required them because of basement occupancy. Spread out floor plans were the second most important factor.

 An additional thermostat was required in 24 percent of the Cleveland homes. More than half of them were required because of basement occupancy.

4) In the Houston study it was found that the percentage of homes needing additional thermostats was 20 percent. The two major reasons were spread out floor plans with their attendant exposure problems and varying temperature requirements between sleeping and living areas.

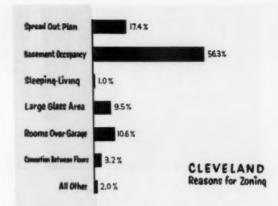
 In Minneapolis, 19 percent of the homes were found to require two or more thermostats with basement occupancy again the dominating factor.

6) In New Orleans, 16 percent of the homes needed two or more thermostats. Rambling and spread out floor plans along with differing requirements for sleeping and living areas were mainly responsible.

7) The same situation existed in St. Louis, where 15 percent of the homes required additional thermostats. In this instance spread out and irregular floor plans were the chief reasons.

8) The special study conducted on Long Island found that 66 percent of the homes needed two or more thermostats. In this area land prices are high and split level homes in great favor. Recreation rooms and living areas are frequently located at or below ground level.

As a result of this study we now know that there is an unexploited market in new homes requiring two or



IN CLEVELAND the study indicates that basement occupancy was the prime reason for zoning

more thermostats, and we know how big it is. An average of 20 percent of the new homes will require them. In 1957 as many as 200,000 additional thermostats will be required for comfort in these new homes.

Several Ways to Use Zones

It is not the job of the field investigation committee to suggest how two or more thermostats should be used to operate the heating or cooling systems. There are obviously several ways to do it. One is to furnish two or more separate furnaces or air conditioning units. Each would serve its own area and operate under the control of a separate thermostat. This is often the most practical and economical arrangement in a large spread out home.

Separate thermostats can also operate dampers in the duct of a single furnace or air conditioning system. There are at least two possible ways of arranging such a system. One is to have each thermostat continually rebalancing the volume of heated or cooled air to each section of the home by positioning dampers in the supply ducts.

Another method utilizes separate mixing dampers controlled by a thermostat in each area. The volume of air remains constant, but the air temperature to each section is continually varied by mixing the return and conditioned air. No matter which system is used, the amount of heating and cooling should be continually varied according to the heat losses or gains in each thermostat area.

Our mission in life as guardians of the health and warmth of the nation's homes can only be accomplished if we shake the lethargy out of our anatomy and any and all prejudices out of our minds and tell the homeowner what he needs, honestly and with full confidence that our suggestions will be of inestimable value to his future well being. If that means one thermostat or ten of them, let us tell him so and price the job accordingly. He who serves others also best serves himself. And an upgraded job means more money in the till.



CONVENTION committee reviewing program includes: (1 to r) C. B. Buckley, H. D. Hunt, Glenn Ashburn, Wilbur Bull



PANEL WHICH discussed a wholesaler's costs and related problems consisted of (1 to r) R. B. Hesling, Keith Campbell, John Robertson, Larry Hickok, Paul Huish, H. L. Godwin

Wholesalers Learn How To Serve Dealer Better

Members attending NHAW'S spring meeting in Colorado look at costs, try brainstorming to solve problems

WAYS THAT will enable the wholesaler to better serve dealers were presented at the 10th annual spring convention of the National Heating and Airconditioning Wholesalers, Inc. association held in Colorado Springs, Colo., May 5-7.

Most of the information was presented through panels. One such panel discussed the subject "Know All Your Costs of Doing Business."

Next Convention

THE NEXT convention of this association is scheduled for Nov. 18-20 in Chicago at the Morrison Hotel. Non-members of the association are invited to attend. For information about the convention program or on becoming a member, write to Editor, American Artisan, 6 N. Michigan Ave., Chicago, or W. R. Bull, executive director, NHAW, Inc., 1200 W. Fifth Ave., Columbus 12, Ohio.

The speakers told how this knowledge could aid in streamlining a wholesaler's operation by showing him how to eliminate inefficient methods in favor of more economical procedures. The panel consisted of six wholesalers, Larry Hickok, Ohio Furnace Co., Inc., Columbus, acted as moderator with Keith Campbell, Keith Supply, Inc., Ogden, Utah; R. B. Hesling, Climate Distributing Co., Inc., Van Nuys, Calif.; Paul Huish, Armstrong Supply Co., Salt Lake City; H. L. Godwin, Southernair Co., Durham, N. C.; and John Robertson, Robertson Heating Supply Co., Alliance, O., as members.

In opening the discussion, Mr. Hickok said, "A recent survey conducted by this association has shown that volume is down, inventory is up, and accounts receivable are being extended over longer periods. This condition, with general business conditions not as favorable as they have been in recent years, indicates that it is important to know all costs of doing business in today's market." The panel took Mr. Hickok's suggestion as a theme in making their recommendations.

Speaking on ways to cut sales expenses, Mr. Godwin outlined the findings of a recent national sales executive conference. He said that sales costs could be reduced by: 1) using only well paid salesmen because they are better workers and less inclined to take advantage of expense accounts, and 2) using company owned cars and trading them in after 40,000 miles.

To save salesmen's time, he recommended that more money be spent on advertising, indicating that an advertising agency frequently performs the service more effectively and economically than an employee of the wholesaler. He recommended the use of direct mail and greater use of the sales tools provided by manufacturers.

The advantage of knowing the local market was emphasized when he suggested that market research data be applied to develop the local market's potential. If no local market research data is available, the wholesalers were advised to conduct their own market research.

The last item mentioned by Mr. Godwin was the suggested use of a

simplified type of salesman's report form — one that enables the salesman to briefly but thoroughly present pertinent sales data.

The subject of reducing operating expenses connected with selling was covered by Paul Huish, who outlined the problems encountered when wholesalers were serving thinly populated areas. He told of one wholesaler whose salesmen served areas as far as 400 miles from the warehouse. The costs involved in traveling such distances were considerably higher than those incurred by a wholesaler servicing a metropolitan area.

Both types of operations can save money by owning and operating their salesmen's fleet of cars, he said. One case showed that 1½ cents per mile had been saved, amounting to over \$1400 in a year. Mr. Huish recommended the use of station wagons since they provide more space for portable demonstration equipment.

Administrative expenses were covered by Keith Campbell who indicated that the average wholesaler's expenses in this category would be eight or nine percent of gross sales. Mr. Campbell listed the following as administrative expenses: officers' salaries, office salaries, payroll taxes, bad debts, equipment repair, licenses, association dues, utility costs, correspondence and communication expenses, insurance, travel pay for officers, financing and collection costs, and accountants' fees.

Inventory costs were described by R. B. Hesling, who placed this cost of doing business at between four and five percent of gross sales. In this category he listed: wages of warehouse employees, rent, trucking costs, warehouse machinery and other equipment, and payroll tax of warehouse personnel. Mr. Hesling recommended that wholesalers group their merchandise into related categories, so that costs for handling could be accurately checked.

Drop Slow Moving Items

He suggested that merchandise that moved slowly be dropped if it was found that the dropping of the products in question did not affect

These Committees Worked Behind Convention Scenes

DEALER management subcommittee plans extended education pro-





AIR conditioning committee reviews proposed list of refrigeration equipment



FAIR trade regulations are considered by trade relations committee



EXTENSION of sales training under WIDA was planned by this committee



DEALER sales training programs were coordinated by this committee

the overall service offered dealers. He said that slow moving products usually fall in a borderline category and could usually be discontinued without affecting a complete inventory of the materials needed to supply the warm air heating-air conditioning industry.

The problem of handling bad debts was covered by John Robertson who indicated that there is a trend toward charging 1 percent per month on all delinquent accounts over 60 days old. This he indicated was a service charge to defray the expense of money borrowed to meet operating capital requirements.

Mr. Robertson also said that the average wholesaler should expect his bad debt account to amount to about one half of one percent of gross sales volume. In talking to experienced credit managers, he learned that where bad debt percentages were less than one half of one percent, it indicated that the credit risk policy was too strict, but where the bad debt figure exceeded this percentage, it indicated that the credit risk policy was too lenient. He also said that bad debt insurance rates for the heating industry were too high to warrant the use of insurance as a means of offsetting losses due to bad debts.

Try Idea Session

In another session, individual capabilities of people to develop constructive ideas was put to work. This session utilized three groups - two groups (nine each) of men and one group (ten) of ladies. Each group was given a specific subject and challenged to voice the greatest number of constructive ideas that would offer ways and means to solve the problem presented by the subject. A public stenographer was used to record the comments offered. After suggestions were obtained they were used to pick out the most effective procedures to follow.

Introducing the rules for this session — known as "Brain Storming" — was Charles J. Korsoski, vice president, Gates Rubber Co. Mr. Korsoski also acted as moderator

while the groups were presenting their recommendations. The rules governing Brain Storming sessions were: 1) do not criticize, 2) let yourself go, 3) quantity is more important than quality, 4) hitch hike. (By hitch hike, Mr. Korsoski said, he meant that panelists should add comments to suggestions made by other panelists.)

This activity helps to develop creative thinking which is the difference between progress and a stalemate, he said. Previous brain storming sessions have shown that women are 25 percent more creative than men; this was the reason why ladies were asked to participate in the program.

Review Uncovers Ideas

Carrying the subject of creative thinking one step further, Mr. Korsoski said that a review of the suggestions made often uncovers some very valuable idea sources that can be developed into money-making or money-saving opportunities. He suggested that each idea be subjected to these four steps: first, study the suggestion, then ask questions about it, even if it already appears clear; second step - attempt to 1) adapt, 2) modify, 3) substitute each suggestion in the operation to which it is related; third step, - add, multiply, divide and subtract each part of the suggestion; fourth step - look at the suggestion frontwards, backwards and even upside down to drain all of the essential value from it.

Each group was given a 10 minute period to see how many ideas could be suggested. Group A offered 91 ideas; group B, 58; and group C, 108. After a brief discussion on the value of "hitch hiking" a second period of three minutes' duration was given each group. This resulted in an additional list of 22 ideas from group A, 15 from group B and 42 from group C.

The subjects discussed and those who participated in the groups offering suggestions were:

Group A: "How can the heating and air conditioning industry secure a more equitable share of the consumer dollar?" R. E. Gray, Harry F. Haldeman, Inc., Los Angeles; W. P. Collins, Connor Co., Peoria; W. E. O'Connor, Acme Furnace Fitting Co., Chicago; R. B. Gilbert, Rheem Mfg. Co.; E. J. Cullen, Inland Steel Products Co.; Ray Westlund, Independent Blade Co.; H. F. Brundage, The Brundage Co.; C. L. Brooks, Armstrong Furnace Co.; Victor Prince, W. C. Downey Co., Inc., Springfield, O.

Wives Give Their Views

Group B: "How can a wife help her husband in the heating and air conditioning wholesale business?" Mesdames George Sprick, Modern Equipment Corp., New Haven, Conn.; R. B. Hesling, Climate Distributing Co., Inc., Van Nuys, Calif.; Wm. H. Brauer, A. G. Brauer Supply Co., St. Louis; Gail C. Mason, Warm Air Heating Supply Co., Dearborn, Mich.; C. O. McKerihan, Union Roofing & Heating Supply Co., Inc., Altoona, Pa.; Jack Allen, Allen Heating Supply, Inc., Buffalo; Tom Delaney, Waterbury Heating Supply Co., Minneapolis; Ralph Bell, Richmond Supply Corp., Richmond, Ind.; J. Orville Garrett, Loman Supply & Equipment Co., Inc., Greensboro, N. C.; Richard J. Young, Young Heating Supply, Inc., South

Group C: "How can heating and air conditioning wholesalers more effectively compete against direct selling methods?" A. L. Thys, W. M. Dunbar Co., Birmingham; J. B. Allen, Allen Heating Supply Co., Buffalo; Frank Green, Heating Wholesalers Co., Des Moines; Joe M. David, Lewie David Co., Sullivan, Ill.; Kenneth S. Hopwood, The Hiser Supply Co., Cumberland, Md.; H. G. Silver, Colorado Springs Supply Co., Colorado Springs, Colo.; P. L. Parker, Prestige Heating Products Supply Co., Rockford, Ill.; R. W. Allen, Atlas Supply Co., Winston-Salem, N. C.; W. H. Abbenzeller, Heating Trades Supplies, Inc., Toledo.

Concluding the session, Mr. Korsoski pointed out that this procedure could be very effectively and periodically used by each wholesaler in his own organization.



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JalZinc is available in a wide range of gages and widths in both cut lengths and coils. It can be furnished in coating weights from 1.00 oz. to 2.50 oz. per sq. ft., depending on your end product needs.

Get details from your local J&L district office or write to the Jones & Laughlin Steel Corporation, Dept. 518, 3 Gateway Center, Pittsburgh 30, Pa. For out of stock requirements, call your local steel warehouse or sheet metal distributor.

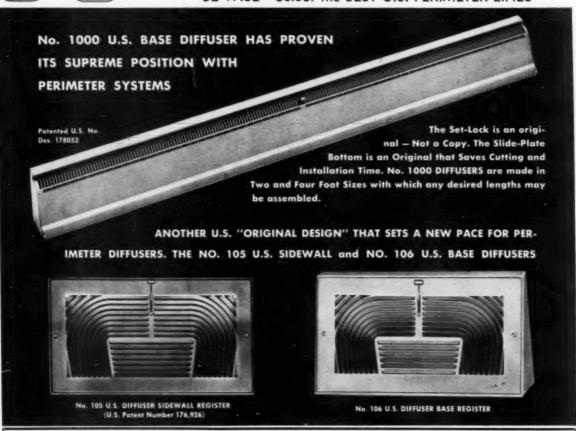


Jones & Laughlin ...a great name in steel



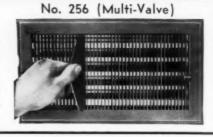
REGISTERS and GRILLES "DELIVER the GOODS"

Select the U.S. LINES KNOWN the WORLD OVER
for SUPERIOR QUALITY AND CHARACTER
BE WISE—Select the BEST U.S. PERIMETER LINES





The GREATEST SINGLE VALVE and MULTI-VALVE STYLES of AIR CONDI-TIONING REGISTERS ON EARTH—LOWEST COSTS





GET OUR COMPLETE PRICE STRUCTURE

UNITED STATES REGISTER COMPANY

BATTLE CREEK, MICHIGAN MINNEAPOLIS + KANSAS CITY + ALBANY

IMMEDIATE DELIVERY FROM STOCK USS GALVANIZED SHEETS

from 10 to 30 G.S.G. in any width and length



If you work with galvanized sheets, you know the superior workmanship you can turn out with USS Galvanized Sheets. For here is a top-quality sheet with a tight, uniform coating of zinc that resists cracking and flaking under severe forming operations. You can lock-form, bend, roll, cut, stamp, solder or spot weld them without damaging their smooth finish. As a result, your products will stand up in all kinds of weather and retain their clean appearance many years longer, USS Galvanized Sheets are always uniform in ductility, flatness and surface finish.

When your orders call for cutting or shearing, you can be sure that our modern equipment and experienced men will keep tolerances close and scrap loss to a minimum. Every shipment will arrive in good, ready-to-use condition. Your nearest U. S. STEEL SUPPLY Warehouse is now stocked with a complete line of these famous sheets and can give you immediate delivery . . . anywhere you say.

U.S. STEEL SUPPLY

P. O. Box 1099, Chicago 90, III.



General Offices: 208 S. LaSalle Street, Chicago 4, Ill.



Sterishaw-Fulton

CONTROLS COMPANY

NOW TEAM UP TO CENTRAL HEATING

Your supplier picture has changed! ACRO Manufacturing Company, manufacturer of Crise Controls, is now a division of Robertshaw-Fulton Controls Company, well-known producer of dependable heating and industrial controls. As a result, the high quality, competitively-priced central heating controls formerly manufactured under the Crise name will now be marketed as Robertshaw Controls.

What does this new move mean to you? Just this. It necessitates a new look at who's who in the field . . . a re-appraisal of your controls suppliers . . . indicating a major shift in the way you rate them. For now, the combined engineering, design, manufacturing and marketing experience of Robertshaw-Fulton and Acro-Crise can give you several important advantages.

You benefit from greater field-engineering repre-



TR SERIES



DT SERIES

Room Thermostats

Graceful styling and sales appeal are combined with reliability and precision thermostat action in two new ultra-modern designs for 1957. Both the TR Series and the less expensive DT Series are built for simplified wiring and easy installation.



Fan and Limit Controls

New FAL40D Fan and Limit Control combines all the features of bulkier combination controls in one compact, easily-installed unit. Improved terminal arrangement provides greater wiring space. The limit circuit may be line or low voltage.



SERVE YOU IN THE CONTROLS FIELD

sentation, improved service, a pooling of creative talent for new controls development work. And equally important, you now build greater prestige and sales appeal into your original equipment with Robertshaw Controls.

Take advantage of this new controls team. Discuss your applications with a Robertshaw-Fulton sales engineer . . . or write direct for additional information.



ACRO DIVISION Columbus 16, Ohio

In Canada: Robertshaw-Fulton Controls (Canada) Ltd., Toronto



Valves, Safety Pilots and Thermocouples

The HC-E is the latest in combination gas controls—a completely quiet valve and safety pilot in one assembly. An SV Series of soft seat type solenoid valves is also available. Both types are recommended for all types of central heating equipment.

THERMOCOUPLE



ı



Zone Control Systems

Zonetrol now makes zone control of heating and air conditioning practical and economical for every home owner. Eliminates many expensive accessories. Extra-easy to install!

Thermostat and linkage included if required.



Folder Makes Prospects Think About Cooling

A PROMOTION PIECE that has proven very effective for a Richmond, Va. heating-cooling dealer is a $31/2 \times 81/2$ in. two-color folder entitled "My Heating Ducts Are Sized for Cooling." Richard H. Catlett, Catlett-Johnson Corp., says it has been exceptionally productive when presented to residence architects.

The booklet was prepared to help the prospective home buyer select the type of equipment that will serve him best. The opening paragraph reads: "This information is provided to point out the possible pitfalls in combination forced air heating and cooling systems and is offered because we have seen so much misunderstanding and disappointment. It does not claim to show every possible layout or to give you all the technical details, but we hope it will make you realize that there is more to a cooling system than cold air and more to a heating system than warm air."

Questions Provoke Thought

The second paragraph follows through with four important questions:

- 1) Is the blower sized to handle summer air conditioning air volume?
- 2) Are diffusers sized and located properly?
- 3) Are return openings adequately sized and properly located?

4) Is exposed ductwork insulated? The following three inside folds each contain two drawings which illustrate various supply and return opening locations and the effect they have on room air temperature under winter and summer weather conditions. Typical locations for supply openings are described and the direction of the air patterns from each are illustrated. Advantages and disadvantages are pointed out. The brief lesson is concluded with a diagram of the air pattern the Catlett-Johnson Corp. recommends to provide most comfort during both heating and cooling seasons.

Selling Message Is Brief

Following the illustrations is a summary of the information presented. Under the headline, "Your Home Can Be Comfortably Cooled," the message, in layman's language, says:

"The simple system we have described is only one of the many ways of cooling and heating a home. There are others providing more elaborate control of temperature and humidity; more complex systems which allow individual zone or room control.

"There are excellent methods of adding separate cooling systems to homes which already have satisfactory heat of a type not suitable for a combined system.

"Each home presents its special problems which challenge the ingenuity of the designer.

"We are always on the lookout for new products and new procedures which will simplify the accomplishment of clearly defined requirements. Our organization is composed largely of young engineers who respect and follow basic and proven principles."



COLORFUL mailing piece gives quick picture of cooling comfort under various arrangements and conditions

The back of the folded mailing piece carries the company's symbol, a list of the nationally known manufacturers it represents, and the firm's address and phone number.

Prospective home buyers have indicated their confidence in the principles recommended by Catlett-Johnson Corp. by helping the company to build its year 'round annual dollar volume to the highest level since the company was founded in 1936.

DISTRIBUTORS - WHOLESALERS

Don't forget ...

OF MONEY AND SPACE
PUTS YOU IN BUSINESS WITH
CHAR-GALE



YOU INVEST...



YOU GET ...



40 JOBS

HERE'S HOW!

Just \$4,000 and 300 square feet of warehouse space are enough to start a profitable increase in your business with the Char-Gale air distribution system. Immediately, with no big commitment on your part, you're in a position to offer your dealers the *finest* complete, simplified air distribution system on the market, *for heating or cooling*.

A Char-Gale truck will bring all the elements of THE Char-Gale "Gale-Aire" comfort air distribution system direct to your door, in one convenient delivery. You don't have to be concerned about matching units from different sources, or hoping to coordinate a series of deliveries, because it's all there, in ONE CONVENIENT LOAD. Even after Char-Gale becomes a big part of your business, you can keep inventories down, because Char-Gale trucks travel anywhere in the country in a hurry. And you get truckload discounts on any combination of Char-Gale equipment.

All the material for 40 jobs, heating or cooling, is brought to you in your first Char-Gale truckload. This includes plenum, fittings, duct and registers. Everything is designed and manufactured for simple installation and efficient operation. And it comes to you completely packaged, for easy storage and protection against damage.



Act Now, to Increase Your Business and Your Profits, with Char-Gale!

As you can see, it's not necessary to tie up your capital in large inventories of duct, fittings and registers. By stocking the simplified "Gale-Aire" system, you and your dealers get a complete air distribution line for either heating or cooling, that's easy to store, sell and install.

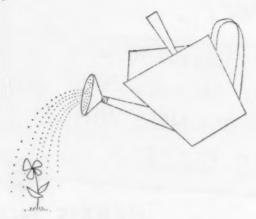
For further information, write us, today!

Char-Gale

MANUFACTURING COMPANY

PLUMBING, HEATING CONTRACTORS!

If you want more new construction business, this advertisement will be of service to you—because . . .



We help make your business grow

Unless you know what's going to be built, trying to get business in the new construction field is like planting seeds at random — you can't be sure what, if anything, is going to come up, where or when. Dodge Reports won't make your flowers sprout, but these timely, accurate, daily reports will help make your business grow. How? Read and mail the coupon in, and we'll tell you.

TO: DODGE	REPORTS.	DEPT.	164	119	WEST	40th	STREET.	NEW	YORK	18.	N.	Y.
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Yes! I'd like to pin-point my prospects by knowing in advance who's going to build, what, when, where.

I want to know whom to contact and when to submit bids.

I'd like to see some Dodge Reports, and I'd like a copy of your booklet that tells how to use this accurate, daily, up-to-the-minute construction news service.

I understand that I can pick just the area in the 37 Eastern States and the type of construction activity that interests me. Also, that I won't have to wade through mounds of data to find the information I need.

of data to find the information I need.	
I'm interested in General Building House Construction	Engineering (Heavy Construction)
in the Following Area:	
NAME	White the same of the
ADDRESS.	
CITYZONESTATE	Por Timed Selling to the Construction In

are you Always

LOW BIDDER

surely not

... when you justify your actual overhead and your real net profit!

So ... in order to successfully close your sale you must justify the difference in price to your prospect.



TVICTORF

Dealers Are Doing This ...

FURNACE WITH THE HEAT RADIATING FINS



Yes... we can prove to you that VICTOR dealers are doing just this! They close more sales... at bigger profits. BECAUSE... they are handling a line famous for quality, with patented fuel-saving FINS which give the owner more real heating comfort at a 20% to 30% saving in fuel. Other features of genuine merit, plus a 15-year warranty, clinch sales. Get out of the competitive class with VICTOR!

HALL-NEAL FURNACE CO.

Quality Furnaces Since 1890 1322-42 N. CAPITOL AVE. INDIANAPOLIS 7, INDIANA

HALL-NEAL FURNACE CO.

1322-42 N. CAPITOL AVE., INDIANAPOLIS 7, INDIANA

Please give me details at once of VICTOR Gas, Oil and Coal line, and the extra profits I can make with an EXCLUSIVE VICTOR franchise.

NAME

FIRM.

CITY_

STATE

YOU AND THE LAW

Rule of Reason Governs Employment Contract

Contracts which prevent employee from working for competitor or in competition must be reasonable and limited with respect to time and place

A LAWSUIT was brought before a court of one of the eastern states by an employer against a former employee to prevent this employee from working for a competitor. In the employment contract on which this lawsuit was based, it was provided,

"The employee agrees that during the period of his employment and for two years thereafter he will keep secret and not divulge or allow to be divulged to any party except by the express order of the employer, the names and/or addresses of those who may be or have been customers of the employer during the period of the employee's employment, and further agrees that he will not divulge any information concerning the business methods of the employer or concerning the business of any of said customers.

"The employee agrees also that for a period of two years after the termination, for any cause, of said employment, that he will not either in competition with or for a competitor of the employer solicit, sell to or install for any of the employer's customers whom said employee may in the course of his employment have served. The employee also agrees that for a period of two years after the termination for any cause of said employment, he will not, either in competition with or for a competitor of the employer, solicit, sell or install within an area of 35 miles from this employer's place of business."

In his defense to this suit the former employee contended that the agreement was unreasonable in its restrictions and unenforceable. In sustaining the contention of the former employee and holding him not bound by these provisions, the court said of this and other contracts of such character:

"It is well known that a prospective employee gives little thought to a restriction such as we are concerned with because he is anxious and therefore intent upon getting a job and is willing to make such promises as are declared necessary as a condition precedent.

"On the other hand the employer too is engaged in a struggle for survival and may attempt every effort to gain and retain the goodwill of his customers. A reasonable balance must be maintained."

To this comment the court added its conclusion regarding the validity of the contract involved in this action: "Almost without exception the law is that where the restriction is excessive, and its reach is greater than is necessary for the employer's protection against 'unfair' competition, or it provides for restraint of the employee from competing after the termination of the employment in a territory exceeding that in which the employer does his business, as in the instant case, the restriction has been considered excessive and therefore invalid."

Must Be Limited

Here the court referred to an earlier decision in that state in which a restriction of one mile in territory for five years was held valid and enforceable. "The test of its validity," said that court, "is the reasonableness of the restraint it imposes. To meet this test successfully the restraint must be limited in its operation with respect to time and place and afford no more than a fair and just protection to the interests of the party in whose favor it is to operate without unduly interfering with the public interest."

Another contract of this character that was the subject of a lawsuit in a midwestern state contained an agreement by the employee that he would neither directly or indirectly compete with this employer within a radius of twenty five miles without the employer's consent.

"As a rough rule of thumb," said the court of this agreement, "the law is that a covenant restraining an employee on termination of employment from competing with his former employer is valid, if it is reasonable in view of all the circumstances of the particular case."

President Taft Quoted

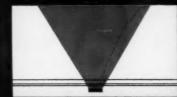
When a judge of the United States appellate court, the late President Taft said of contracts of this character, "It was of importance that business men and professional men should have every motive to employ the ablest assistants and to instruct them thoroughly, but they would naturally be reluctant to do so unless such assistants were able to bind themselves not to set up a rival business in the vicinity after learning the details and secrets of the business of their employers.

"Covenants in partial restraint of trade are generally upheld as valid by an assistant, servant or agent not to compete with his master or employer after the expiration of his time of service. Before such agreements are upheld however, the court must find that the restraints attempted thereby are reasonably necessary to the protection from the danger of loss to the employer's business."

[Note: While this discussion applies to actual cases, it should be remembered that legal rules wary in different states.]



plain to see



FLOOR DIFFUSER



SHORT BASEBOARD DIFFUSER



EXTENDED THERMO-BASE

genuine

Thermo-Base

extended baseboard air distribution system ... America's greatest comfort discovery

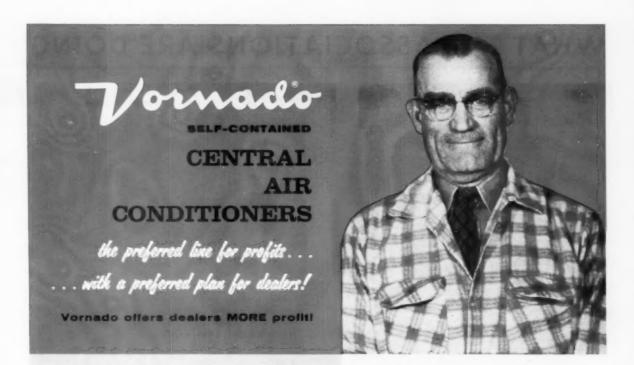
a product of GERWIN INDUSTRIES INCORPORATED michigan city, indiana

"CRESTOGRIP"

The NEW Utility Plier



Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by



Here's Proof! J. D. Parrish Plumbing & Heating Co., Birmingham. Alabama, says: "I can count on more profits from Vornado, because my expenses are kept to a minimum. Typical Vornado Central Air Conditioner installations can be made in the matter of a few hours with a minimum crew, and Vornado is dependable. I have fewer "call-backs" to eat into my profit."

Vomade Installs fast, easily, anywhere!

Vornado Central Air Conditioners can be attached to the heating system ducts, or installed as a complete and separate system — and, it goes anywhere...in the attic, crawl space, basement, furred down hallway, on the roof, or in the garage.

COMPLETELY PACKAGED everything in one compact, sturdy package! Air cooled to eliminate extra plumbing... water connections...outside accessories.

OUTSTANDING PERFORMANCE powerful! With two hermetically sealed, heavy-duty compressors to deliver unequalled capacity. One operates continuously...constantly removes excess humidity. Other cycles on and off as needed for economy's sake.

FULLY GUARANTEED by the manufacturer! Factory warranty assures satisfactory service. Over 7 million satisfied Vornado users.

product of

The O. A. SUTTON CORPORATION, INC. World's leading full line manufactures of comfort cooling appliances WICHITA, KANSAS

Distributed in Canada by: Alliance Motors, Schell Ave., Toronto 10.

send

TODAY

VORNADO'S PREFERRED "SELECTED DEALER PLAN"

gives you a BIGGER share of this fast-profit business!

- * Adequate Sales Area
- * Proven Prospect Plan
- Powerful Merchandising and Advertising Assistance
- * Traffic Building Promotions
- * Continuous Sales Training
- * FULL PROFITS



I want complete information on your new versatile, low-cost Varnado Central Air Conditioners. It is understood there is no obligation.

AA-6-57

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WHAT THE ASSOCIATIONS ARE DOING



NEW PRESIDENT of Pennsylvania association R. J. Cronan (third from left) is congratulated by Earl Liebermann, secretary-treasurer. Vice presidents Bernard Lawrence (right) and Walter Keist wait their turn to join in greetings



NEW OFFICERS of the Salesmen's Auxiliary get together after election: (1 to r) David Alspach, third vice president; Charles A. Fink, president; Thomas Byerly, first vice president; H. S. Criswell, treasurer, and (seated) Everett Smith, secretary

Dealers Shown How to Make Accurate Estimates, More Profit

Sample estimating problems are solved in classes at annual convention of the Pennsylvania association

To be sure a fair profit is earned on every job, the dealer or contractor must know how to estimate accurately the bid he offers. This point of view was the theme for the annual convention program of the Sheet Metal, Air Conditioning and Roofing Contractors' Association of Pennsylvania held April 26-27 at Williamsport. Three major fields—industrial sheet metal, heating and cooling, and roofing—were covered in separate sessions. In each session, sample estimating problems were offered the audience and suggested procedures outlined by a panel of speakers.

Officers elected for 1957 are: R. J. Cronan, Reading, president; Bernard Lawrence, Greenville, first vice president; Sam S. Hahn, Easton, second vice president; Walter E. Keist, Pittsburgh, third vice president; Earl W. Liebermann, Ambridge, secretary-treasurer; and J. E. Harper, Sr., Monaca, sergeant-at-arms.

New directors elected for three years are: Charles Luppold, Reading; Frank Cordes, Rochester; and R. W. Winger, Grove City. Directors with two years to serve are: Gilbert E. Keir, Pittsburgh; A. J. Sabathne, Altoona; and Joseph C. Stark, Beaver Falls. Directors with one year to serve are: Glenn Meyer, Sharon; John Henke, Erie; and Carl Ammon, West Reading.

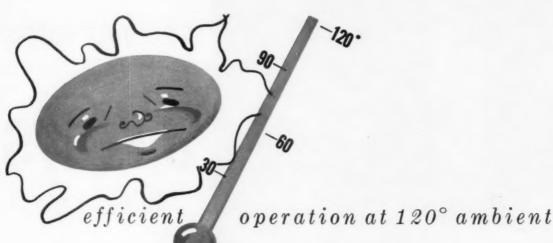
New officers elected to head the salesmen's auxiliary

of the association are: Charles A. Fink, Lyon, Conklin and Co., president; Thomas F. Byerly, Proie Bros., first vice president; Thomas McCombs, Famous Furnace Co., second vice president; David A. Alspach, Busser Supply Co., third vice president; and H. S. Criswell, McClure-Johnston Co., treasurer. Auxiliary directors elected are: James W. Paddock, Famous Furnace Co.; E. K. Thompson, Thompson Paint Co.; and N. S. Hearn, Buckeye Furnace Pipe Co., who will complete their terms in 1958. C. H. Hagmann, Warren Co.; J. J. McGready, Benjamin P. Obdyke, Inc.; and Dan Boyer, Potts, Farrington Co. will serve until 1959. Gene J. Niccoli, C. G. Hussey and Co.; Steve C. Goodnough, Follansbee Steel Corp.; and Howard Wilhelm, McClure-Johnston Co., will serve until 1960.

Make Bids on Duct System

The convention hall became a classroom when Carl Ammon, West Reading contractor, passed out copies of blueprint for a duct system to supply conditioned air to a manufacturing plant. The distribution system was to supply air to private and general offices, shipping and packing rooms as well as to a factory assembly area.

(Continued on page 93)



HERMETIC air-conditioning COMPRESSORS

are made to take it under the toughest

conditions.

years, Tecumseh has completed and offered to the industry, many major engineering developments on tough air conditioning problems:

1st, they did the obvious by designing a line of compressors expressly for air conditioning.

2nd, this line has been continually improved and developed by tremendous "know how" already gained as the world's leading manufacturer of compressors that will perform efficiently under any air conditioning situation — compressors that will deliver full-rated capacity at 90° ambient with a 45° coil, and will continue to operate at 120° ambient and to cool even on 90% of rated voltage.

120" amhient and to cool even on 90% of rated voltage.

Tecumseh offers you a complete line, including compressors designed for either air or water cooled applications, single or three phase current, and a choice of stub tubes, solder valves or flange valves, with or without oil sight glasses. These various combinations allow you to select the compressor exactly suited to your needs.

Don't compromise, investigate the complete line for your application!



MODEL JE300 3 H. P. HERMETIC SINGLE PHASE FLANGE VALVES

THE ONLY COMPLETE LINE OF HERMETIC COMPRESSORS SPECIFICALLY DESIGNED FOR AIR CONDITIONING



Over 29,000,000 Compressors in use today

PRODUCTS

Marion, Ohio Tecumseh, Michigan

EXPORT DEPT .- P. O. Box 2280, 24530 Michigan Ave., W. Dearborn, Michigan



G-E BLOWER MOTORS PROVIDE . . .

3 Ways
to cut your
installation
and service time

QUICK INSTALLATION



QUICK-CONNECT TERMINALS offer a more rapid wiring method, yet do not interfere with conventional studs.



SPEED NUT welded inside shell of G-E fhp motor permits fast outside connection of conduit fitting.

2. BETTER PERFORMANCE



SUPERIOR MYLAR* INSULATION (right) has 35 times the moisture resistance of ordinary paper insulation, resists effects of heat and age.



DOUBLE LUBRICATION LIFE provided by 50% more oil, and efficient oil retention system cuts maintenance to a minimum.

3. LOCAL SERVICE



PROMPT REPAIR SERVICE through General Electric's network of Small Motor Service Stations is as near as your telephone.



REPLACEMENT MOTORS are also available locally. G-E Form G replacement motors provide top-quality, long-life performance.

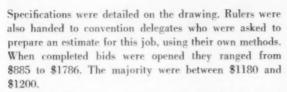
*Reg. trade-mark of DuPont Co.

FOR MORE INFORMATION ON G-E FHP MOTORS, WRITE SECTION 702-51, GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.





HEATING and cooling panel reviews cost estimating procedure: (I to r) Walter Keist, Joseph Stark and John Henke



The method used to obtain the actual selling price of \$1118 was outlined by Mr. Ammon who described an estimating form he had developed which helps speed up the preparation of bids and which reduces the possibility of errors. (The selling price of \$1118 provided a gross profit in the neighborhood of 10 percent.)

The form described by Mr. Ammon provided space for the total number of feet of different size duct sections. The sections were converted to pounds of sheet metal used and charged for at the company's installed per pound rate. Cost of equipment at its selling price, insulation, mastic cement and angle iron supports were added to obtain the quotation figure.

The potential market for equipment fabricated from aluminum sheet was described by W. S. Acuff, Jr., Reynolds Metals Co., who said that there were only three major producers in the aluminum industry today but there would be five major producers by the end of 1958. The use of end products by the public will depend upon the methods of fabrication used by sheet metal contractors, he said. One of these is the ability to economically join sheet aluminum at joints to provide watertight connections. He demonstrated a glass fiber bristle brush that made it possible to use 50-50 lead-tin solder to produce a watertight joint between two pieces of sheet aluminum.

Talks on Stainless Market

Speaking on the market potential for stainless steel, Joseph R. Irwin, United States Steel Corp., said there were 39 types of stainless steels on the market, one to fit every need of the fabricator. He said that 18-8 (302) was



NEW TECHNIQUE for soldering aluminum is demonstrated for contractors by (1 to r) D. A. Nunn, Carl Ammon and W. S. Acuff, Jr.

the most commonly used stainless steel but that 430 was second in popularity, with 316 in third place. Due to the nickel shortage, the basic problem in producing the volume to meet the demand for 18-8, the newly developed 201 and 202 types were fast becoming popular replacements for type 302. The ability of sheet metal contractors to use types 201 and 202 with confidence is being demonstrated in the many applications that adequately meet the requirements set for type 18-8.

A panel on heating and cooling consisted of dealers W. E. Keist, Pittsburgh; J. C. Stark, Beaver Falls; and John Henke, Erie. These men described certain portions of the heating and cooling field, unusual applications, market potential, trends and methods of estimating various types of jobs. Mr. Keist said he believes that in 10 years the all-electric heat pump will be a major factor in the annual dollar volume of installed business recorded by dealers. He gave as his reasons: 1) power costs will become lower; 2) heat pumps provide both summer and winter air conditioning from the same energy source; 3) improved performance characteristics will be developed due to extensive research; 4) original equipment costs will be lower.

How to estimate and plan a heating system for a turkey hatchery was described by John Henke who recently installed radiant type gas-fired unit heaters on such an application. Requirements specified that the area had to be draft-free yet have an adequate ventilating system. Two low-speed penthouse fans were used to remove air from the space above the turkey cages and the radiant rays of the unit heaters accomplished the 80 F temperature required. The radiant heaters failed to produce the 80 F below a level 2 ft above the floor, but this had been anticipated and the poultry producer had indicated that he did not intend to use this space for raising the turkeys. Thus, every requirement of the job was met.

One way to build customer good will is through the (Continued on page 96)



Diffuser vanes angled in <u>ALL</u> directions produce perfect perimeter air pattern!

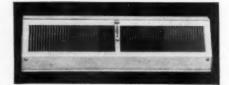
Here's why Mr. John J. Falls of Falls-DeFogie Construction Company is using the "Perfusaire" perimeter diffuser exclusively in their newest housing development at Broadview Heights, Ohio:

"To meet today's competition I specify the best building materials ...in perimeter heating and cooling that means Auer's "Perfusaire". My past experience with the "Perfusaire" has proven beyond a doubt that only Auer's special diffuser design assures proper air delivery to each room. That's an important sales feature because good living comfort means satisfied customers...more sales...fewer call-backs."

"Another thing I like about the "Perfusaire" is that it's a complete unit that installs easily without cutting or fitting. "Perfusaire" cuts my sheet metal contractors' installation time nearly in half and helps reduce labor costs. Believe me, it pays to insist on Auer's "Perfusaire" perimeter register."

Take a tip from Mr. Falls the next time you specify perimeter diffusers and insist on the Auer "Perfusaire". It is the only diffuser that is specifically designed and engineered to produce a true perimeter air pattern for heating and combination heating-cooling jobs. For complete details contact your nearest Auer jobber or write us direct.

NO HOT OR COLD SPOTS. Smoke test proves Auer's exclusive design with diffuser vanes angled in all directions produces perfect perimeter air pattern. Scientific distribution of air eliminates drafty, uneven heating.



PERFUSAIRE ADVANTAGES include: 18" length has capacity of 4 to 8 foot units...installs easily in new or old construction, in or against baseboard or plaster...unit is shipped complete with damper ready for quick installation...no accessories to buy, no stackhead required.



THE AUER REGISTER COMPANY

"REGISTERS AND GRILLES FOR EVERY HEATING AND COOLING NEED"

6602 CLEMENT AVENUE • CLEVELAND 5, OHIO

ALL

General Motors - Standard Oil (N.J.) - Ford Motor - U. S. Steel - Chryster - General Electric - Swift - Belinonem Steel - Minour - Du Pont
(E.I.) de Nemours - Gulf Oil - Western Electric - Secony Mobil Oil - Standard Oil (Ind.) - Texas Cq. - Shell Oil - Westinghouse Electric
Goodyear Tire & Pubber - Standard Oil of California - National Dairy Products - Republic Steel - Union Earbide & Carbon - International Harvester
Firestone Tire & Rubber - Sinciair Oil - Radio Corp. of America - Procter & Gamble - U. S. Rubber - Cities Service - Phillips Patralium - Douglas
Aircraft - Boeing Airpiane - Aluminum Co. of America - General Foods - North American Aviation - Borden - International Paper - Goodrich (B.F.)
American Can - Eastman Kodak - United Aircraft Corp. - Jones & Laughlin Steel - Armon Steel - Spetry Rand - General Dynamics - Lockheed
Aircraft - Continental Can - Sun Oil - American Motal - Inland Steel - Wilson & Co. - Anaconda Co. - Allied Chemical & Dye - National Steel
Corp. - Youngstewn Shoot & Tube - American Tobacco - Pittsburgh Plate Glass - Bendix Aviation - Infernat. Business Machines - Oilin Mathieson
Chemical - Borg-Warner - Kensecott Copper - Republic Aviation - American Smetting & Refining - Allis-Chaimers - National Lead - Continental Oil
Caterpillar Tractor - Monsanta Chemical - Burtington Industries - Beneral Mills - Altantic Refining - Curtiss-Wright - Pure Oil - Studebaker-Packard
Tide Water Associated Oil - Dew Chemical - Reynolds (R.J.) Tobacca - American Cynnamid - Internat. Tol. & Tol. - American Motors - Grace (W.R.)
Crown Zellerbach - Standard Brands - National Biscuit - Foremost Dairies - Raiston Purina - Reynolds Metal - Campbell Seep - Philco - OwensIllinois Glass - Metritt-Chapman & Scott - Union Oil - Singer Manufacturing - Phelps Doirge - United Merchants & Manufacturers - Pillsbury Mills
Standard Oil (Ohlo) - American Radiator & Standard Santary - Doore

of America's 100 largest industrial corporations are users of Clarage air handling and conditioning equipment.

CLARAGE FAN COMPANY
KALAMAZOO • MICHIGAN



CONVENTION HALL becomes a classroom for cost estimating at business session on industrial sheet metal

use of complete service records, Joseph C. Stark said. He recommended that all customers' complaints be carefully studied to determine if a certain type of complaint continues to appear. When such is the case, a good dealer will take steps to correct the cause by altering the installation procedures, he said. Profits are usually one indication of customer satisfaction. Profits can be eaten up in attempts to solve customer complaints. He recommended that "Industry Standards for Heating System Performance" be used to show prospects the way to judge the system proposed by dealers. (Editor's note: Industry Standards are available from American Artisan.)

What local associations are doing to improve local business conditions for members was described by Clyde M. Barnes, editor, American Artisan. He told about the Milwaukee association's "WHAM Campaign," the Cleveland association's "Certified Heating Program," the Grand Rapids association's "Operation Home Improvement Campaign," and the Southeastern Trade Exposition recently held at Atlanta. Mr. Barnes also described individual dealers' programs—the Gary, Ind. dealer who has developed builder cooperation to sell heating and cooling as a feature; the "Test Dealer Program" in Terre Haute, Ind.; porcelain enamel duct systems by a Buffalo sheet metal contractor; plastic duct systems by a Milwaukee contractor, and pioneering in the fabrication of titanium sheets by an Erie sheet metal contractor.

OHI Explores Testing Program

ONE TOPIC which came in for considerable discussion at the OHI convention in Boston, June 3-6, was a proposed performance testing program. The plan would be similar to that used by many manufacturers under which the Underwriters' Laboratories tests equipment for safety and commercial performance standards.

Under the proposed program OHI would write requirements and standards relating to performance which would be similar to or exceed commercial standards. Assuming that a manufacturer's product passed UL and OHI requirements the UL would issue a combination label indicating that these tests had been passed. A fee would be charged for this label with the surplus over costs used to promote the value of the label to the public and to maintain and improve the standards.

At a meeting in February of OHI's board of directors a resolution was passed asking the Engineering Committee to explore the idea through its standards and requirements subcommittee. Since that time, a great deal of work has been done on developing the details of the plan. This program was then outlined at the Domestic Manufacturers' Conference during the convention, and an open discussion of its features was held. A complete report on the convention activities will appear in next month's issue.

Emde Elected President of ARI

The board of directors of the Air-Conditioning and Refrigeration Institute at its annual meeting elected Lud Emde, Birmingham, Mich., as the organization's president. Mr. Emde is president of Temprite Products Corp. He succeeds M. M. Lawler, vice president of Worthington Corp. Mr. Emde has been vice president of ARI for the past year.

Elected to succeed him in the vice presidency was Don V. Petrone, president of Typhoon Air Conditioning Company. Rudy Berg, vice president of the Copeland Refrigeration Corp., was elected treasurer.

Eight newly elected members of ARI's board of directors took office at the meeting. They were E. W. Ervasti, Russell Gray, H. F. Hildreth, L. N. Hunter, B. E. James, F. E. Lehman, J. W. Norris, and D. V. Petrone.

Members of the board who continue in office include: W. A. Bours, C. V. Gary, George S. Jones, Jr., Charles T. Lawson, R. H. Luscombe, Del Moerick, R. J. Powell, Austin Rising, and M. M. Lawler.

Public Health on Institute Agenda

Public Health officials will be invited to join educators and heating-cooling industry experts in the Institute on Climate Control to be held next September on the campus of the University of California at Los Angeles. The Institute will be co-sponsored by the university and the Institute of Heating and Air Conditioning Industries. The health officials will join in a discussion of the influence of artificial indoor climate on the aged, heart patients, and those suffering from emotional and psychological disturbances.

The UCLA meeting will also consider the problem of smog and will evaluate the economic contribution of climate control in making desert areas habitable. The Institute is participating in the meeting as part of its stamp plan public relations program.

(More association news on page 101)



Actual Photo of "Budget-Blower" and Econo-Pak Assemblies in Our Dayton, Ohio Warehouse.

SPACE-SAVING AIDS TO GREATER PROFIT MARGINS

Here's How to Save Warehouse Space...Reduce Costs



Lau makes it possible for you to operate with greater economy and efficiency... even in these days of rising material and production costs. Our

huge warehouse stock permits you to order from week to week...in the quantities you need, in the sizes you require, for the production you estimate.

Bulk packaging of hardware, palletized shipping and quick shipment from stock cuts warehousing and double-handling, cuts your inventory costs as much as 50%, assures your customers of firm delivery.

World's Largest Manufacturer of Air-Conditioning Blowers

Yes, it is not unusual to expect box-car-toassembly-line flexibility when you order from Lau. And too, the Lau staff of specialists in the air-moving industry will work closely with you on your air moving problems.

You enjoy greater economy, and simplicity of assembly with the Lau "Budget-Blower". Learn how you can build up your savings when you specify Lau. Consult your Lau representative today for details.

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Azusa, California. In Canada: The Lau Blower Company of Canada, Ltd., Kitchener, Ontario

Meet Price Competition with EXCELLENCE!

with the complete

New Line of GAS Fired and OIL Fired **FURNACES**

Basementless Homes. As good to look at as it is sturdily constructed.



by moncrief



Year 'Round Air Conditioner
2, 3 or 5 Ton
or Water Cooled
ias or Oil Fired.















Years Ahead in Design . . . Way Ahead in Price!

If you have been losing business to cut-price bidders because you refuse to reduce the quality of your installations - you will want to investigate Moncrief's new line of Winter Air Conditioning Units. Here's why:

1. Dynamic new design by this old-line organization of heating specialists, plus the most extensive new tooling in Moncrief history, make it possible for you to buy the heavily constructed new Moncrief furnaces for less than for many cheaply constructed units.

2. Complete assembly and wiring at the Moncrief factories save you countless hours and dollars of installation expense.

3. Exceptional compactness and outstanding styling give you unmatched flexibility for space-saving installation.

4. Ability to increase the blower capacity, as needed for cooling, permits you to sell the new Moncrief furnaces with the assurance that cooling can be added at anytime.

5. Ready service from your Moncrief Wholesaler enables you to draw the right size and type of unit, when you need it, from nearby stocks.

So, if you want to meet price competition with excel-lence, see your Moncrief Wholesaler for new prices and catalogs, today!

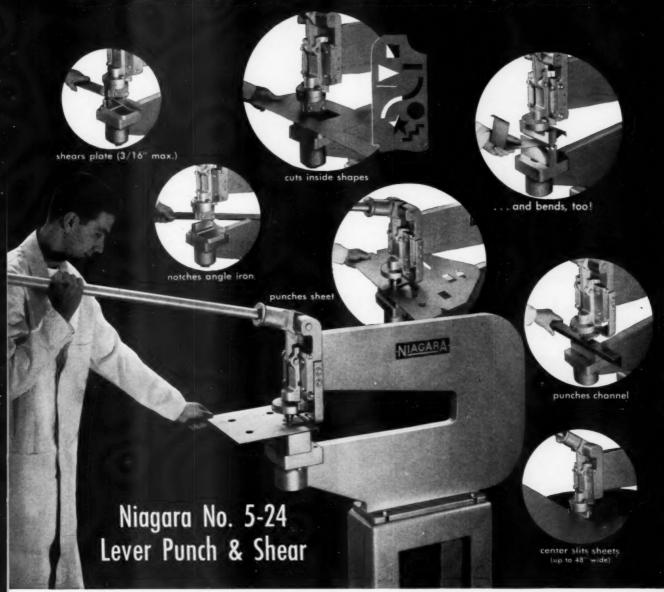
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HEATING AND AIR CONDITIONING UNITS



FURNACE PIPE AND FITTINGS

Here's a machine that's almost a shop in itself!



Because it's so productive . . . because it can handle so many different types of jobs, Niagara's No. 5-24 Lever Punch & Shear never sits on the sidelines. Its continual usefulness has been proved repeatedly in numerous industrial sheet metal shops, maintenance departments, experimental and model shops.

With a 5-ton capacity and a 24-inch

throat, it can be equipped (optionally) as a punch or shear or brake ... or all three! An unusually large selection of punches and dies is available for turning out a tremendous variety of work.

To learn more about this machine and the almost limitless number of jobs it can do for you, write for illustrated Bulletin 79 today.





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America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work



Saves one-third cutting time. Monarch Mobil Homes, Inc., St. Paul, put a SKIL Model 299 Router to an unusual test. The problem: to cut aluminum already mounted on a curved surface. Trials with other routers proved the tool would do the job but soon burned out under the strain of production metal cutting. SKIL Model 299 not only did the cutting perfectly but saved one-third cutting time!



Saves cost of heavy-duty equipment. Steel King Company, Milwaukee, needed a versatile, inexpensive portable saw to cut 22-gauge steel paneling. They tried a SKIL 7¼" Model 874 and found it made every cut necessary. Rips, cross-cuts, 45's and pocket cuts are routine in the 22-gauge steel. "Does the job, cuts down excessive material handling and costs less," say the owners of the company.

Metalworkers SAVE with SKIL Tools

Send for FREE booklet on power tools



Saves \$100.00 per unit. Griffin Tank and Welding Service of Dallas, custom builds geographic photographic equipment. This equipment must be lightproof, weatherproof, dustproof and air tight. "When SKIL drivers were substituted for hand tools for fastening, we saved over \$100.00 per unit (5 gross of #8 screws), and quality improved tremendously," says C. B. Jones, Chief Engineer.



Made only by SKIL Corporation, Chicago 30, Ill. Factory branches in all leading cities.



SAVE with New ½" Drill. All new design—shorter, narrower, one pound lighter! New power for fast drilling on the toughest jobs. Improved helical gears deliver power with top efficiency. No matter what you have to drill, cut, sand or grind, there's a SKIL tool to do the job faster, better, cheaper. Let your SKIL distributor show you why. Or use the coupon below for further information.

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Please send me FREE bookle	et on SKIL power tools.
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Address	
Address	



NO QUESTION is left unanswered at the Chicago area wholesalers' school. Dean Henry E. Theobald uses blackboard to prove a point under discussion by dealers attending course at Northwestern University



AFTER CLASS review of estimating problem is conducted by dealers and instructors: (1 to r) Ben Hursh, Dean Theobald, C. R. Bennett, Wallace Cubberley, Joe Dominik

Chicago Wholesalers Sponsor Dealer Management Course

Wholesalers of the Chicago and central Illinois areas pooled their resources to sponsor the second dealer management course at Northwestern University (Chicago campus.) Charles R. Bennett, chairman for the group, worked closely with members of the university's staff and local industry leaders to present two days of training packed with vital information for the progressive warm air heating dealer.

The program was based around estimating procedures for bidding the heating equipment required for a 1900 sq ft ranch style house. Dealers registering early for the course received a complete set of plans and were asked to prepare a bid the same as they would for a real prospect. The bid was to be mailed to the dean of the business management school. Dealers were instructed not to sign their names but to put identifying symbols on the bid if they wished to discuss their particular bid after the class adjourned.

Bids Compared With Model

When bids were received they were compared with the model bid that had been prepared by the school's staff. In class, the bids were posted by price only and the weaknesses in the estimating and bidding processes were brought out.

To show that there are many hidden costs in doing business and that it is these costs that are usually overlooked when estimating the costs of completing an installation, the university's staff had instructors present detailed explanations of the subjects involved. Where more expert advice could be obtained, such as from the State Sales Tax Department, industry people were asked to explain those subjects.

During the two days, subjects such as these were discussed: Human Relations, FHA Loans, Operation Home Improvement, Business, Personal and Damage Insurance, Liability and Casualty Insurance, Workmen's Compensation, Legal Organizations of Business, Customer Contracts, Financing a Business, Taxes, and a summation of all of these subjects under the heading of "Operating a Business More Profitably."

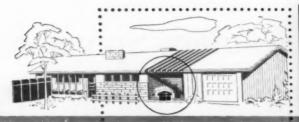
Sponsors of the dealer management course were: Acme Furnace Fitting Co., Armstrong Heating Supply Co., Accurate Sheet Metal & Mfg. Works, Chicago Furnace Supply Co., Excelsior Steel Furnace Co., Mechanical Home Systems, Inc., Murphy & Miller, Inc., and Barney Olson, Inc., all of Chicago. Wholesalers from other communities were: Republic Electric Co., Davenport, Iowa; Marzullo Furnace Supplies, Evergreen Park, Ill; G. W. Berkheimer Co., Inc., Gary, Ind.; Steel Products Supply Co., Lombard, Ill; Central Illinois Distributing Co., Peoria; Connor Co., Peoria; Heating and Air Conditioning Supply and Service Co., Peoria; Heating Products Supply Co., Rockford; and Armstrong Furnace Supply Co., Rock Island.

(More association news on page 104)

YOU'RE WAY OUT

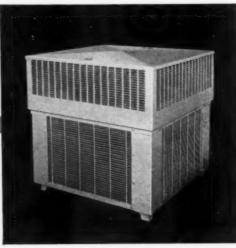
on every 2, 3, and 5-ton job with these

Meguay are conditioning systems



OUTDOOR AIR COOLED CONDENSING UNIT REQUIRES NO WATER

Mount this new McQuay unit anywhere outdoors adjacent to the foundation - on the parch, in the breezeway or even on the roof. Controls are indoors.



These new air cooled two unit McQuay air conditioning systems will put you way out in front of your competition on every 2, 3, or 5-ton job. Extremely quiet and highly efficient, they are low in cost and versatile, so that you can meet any specifications on either new installations or on existing jobs.

McQuay cabinets are bonderized and attractively finished in baked on hammertone gray enamel. Remember, only McQuay has the exclusive ripple-fin coil construction, and McQuay Means Quality. If you haven't already done so, investigate these McQuay two unit air conditioning systems and put yourself out in front of your competition.

Representatives in principal cities or write McQuay Inc., 1653 Broadway St. N.E., Minneapolis 13, Minnesota.

AIR COOLED CONDENSING UNIT

This new McQuay outdoor type condensing unit with built-in hermetically sealed compressor is available in 2,3, and 5-ton capacities to match each of the McQuay evaporators shown at the right. Air cooled, this unit is extremely flexible and can be installed anywhere outdoors. It is compact, efficient, quiet in operation, has exceptionally high capacity and requires no water. An indoor control panel and hi-lo safety control are furnished.



IN FRONT





WITH PLENUM INSTALLATION

The McQuay vertical "RE-V" type evaporator is mounted in the furnace bonnet or plenum chamber and utilizes the furnace blower. It is suitable for all types of forced warm air furnaces, including counterflow. Available in 2, 3, and 5-ton capacities to match the McQuay outdoor condensing unit. High capacity, highly efficient, with McQuay ripple-fin coil construction, fiberglas insulated. Service panel and space for internal valve mounting is provided. Drain pan for collection of coil condensate is built-in.

miguay

SYSTEMS

WILL FIT YOUR AIR CONDITIONING NEEDS!





WITH DUCT INSTALLATION

The McQuay horizontal "RE-H" type evaporator is mounted in the duct of forced warm air systems and likewise uses the furnace blower. It is extremely compact and highly efficient due to McQuay ripple-fin coil construction. Also built in 2, 3, and 5-ton sizes. Thoroughly insulated with fiberglas. Service panel and space for internal valve mounting is provided. Drain pan for collection of coil condensate is built-in.





WITH REMOTE INSTALLATION

This blower evaporator is designed to use its own independent duct system, or for use where no ducts are required. Available in 2, 3, and 5-ton capacities, it is suitable for existing forced warm air systems lacking sufficient air capacity in residential or small commercial jobs or in new systems. Ceiling mounted, requires no floor space. Fiberglas insulated, and with drain pan for collection of coil condensate built-in.

AIR CONDITIONING
HEATING
REFRIGERATION

MICHIGAN

METING
REFRIGERATION

MICHIGAN

MICH

Chicago Honors Past Presidents

Past Presidents' Night is more than a local celebration when the Air Conditioning Contractors' Alliance (Chicago) commemorates its past officers and the guidance they have provided. Industry members from Michigan, Indiana and Wisconsin attend the meeting of dealers, wholesalers, manufacturers, manufacturers' representatives, utility company engineers, and union representatives. The attendance at the fifth annual past presidents' night, held May 11, reached 750, with about 40 percent of the party consisting of industry wives.

The alliance, formed in 1938, has had 15 presidents,



MUSICAL talent from the audience proved there is new hope for old songs. Musicians are (1 to r) Harry Himelblau, Ray Kalvog, Stanley Lundquist and James Prunda

COMMITTEE welcomes 750 guests to the Past Presidents' Night celebration: (1 to r) Barney Sanders, Ed Stahler and Ted Criel



most of whom were present to receive the commendations extended them by the industry they had served. The evening's program was under the direction of Barney Sanders, who headed the past presidents' night committee. Executive Secretary Theodore A. Criel assisted the committee in making the arrangements. Dinner was followed by a floor show with nationally known artists heading the bill. In one act, four members of the audience formed a musical quartet, which proved to be the highlight of the evening's comedy entertainment.

After the floor show, the past presidents gave each lady a three string pearl necklace as a Mother's Day present. Dancing followed the presentation of the Mother's Day gifts.

Distributors Hear Industry Outlook

Wholesalers attending the 47th spring meeting of the National Association of Sheet Metal Distributors heard reports on the outlook in steel, copper, credit, selling and business in general. The meeting was held May 16-17 in Philadelphia.

Doremus L. Mills of the Copper and Brass Research Association told wholesalers that the outlook for the sale of copper is optimistic. He said, "An adequate copper supply, steadying of prices, and an increasing knowledge by the general public of the inherent merits of copper for many applications are all valid reasons for such optimism."

He declared that copper production will be stepped up considerably in the near future, with a total increase of as much as 31 percent by 1962. "In case the demand for copper should warrant a further increase in capacity," he said, "excellent prospects for it exist." Potential properties in Canada, Africa and South America could add well over 100,000 tons annually over the 1962 estimated capacity, he said.

"Most of the field problems that sometimes developed in the use of sheet copper for building construction no longer exist," Mr. Mills declared. "Today the average sheet metal contractor and architect is much better informed regarding recommended practice in these matters than ever before."

"It is now widely recognized," he continued, "That something more than a change in the gauge or temper of the sheet is necessary in order to prevent some of the failures in sheet copper installations that have occurred in the past." He cited proven installation practices that must be followed to assure trouble-free jobs.

F. G. Brown, general manager of sales, coated steel products, Weirton Steel Co., warned against comparisons between the new continuously produced and the old sheet pot produced galvanized sheets. "I think that we of the steel industry were remiss in calling this new product galvanized, for that in many minds immediately associates it with the old sheet pot material," he said. He noted that today most of the continuously produced material is generally referred to as zinc coated sheet.

He pointed out that too many people expected too much of the new product too soon. He compared it with the development of a child. "People became impatient and found fault because he did not walk before he crept and talk before he had a chance to utter the normal baby gibberish," he declared.

(Continued on page 108)

MEN WHO LIKE MAKING MONEY





LIKE Thatcher

Because Thatcher stands for the things that count:

- · Local service and engineering
- · Local "front line" sales support
- Competitive pricing
- Complete line
- Simplified installation—makes your job easier
- Full customer acceptance and satisfaction

Thatcher is the oldest name in home heating... a name that has meant quality continuously since 1850. People know it...respect it...want it.

This famous name is your guarantee of easy sales—to customers who'll thank you, and recommend you to their friends.

THATCHER HEATING UNITS

There's a Thatcher Unit for any fuel, any type, any size your customer wants.

Plus

THESE EXTRA PROFIT-MAKERS!

Summer Air Conditioners that combine with a central heating unit. Add them any time to provide winter warmth and summer air conditioning—all from one central system! Air and water cooled units, self-contained and multiple unit types available.

You are invited to qualify for a Thatcher dealership. Write today.

Thatcher

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Boilers • Burners • Furnaces • Air Conditioners

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Dept. AA657, Garwood, New Jersey

Yes, indeed . . . I'd like to make more money with Thatcher! Please send me more information.

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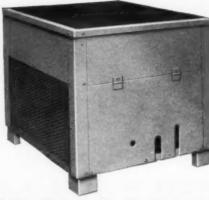
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IN SUMMER
AIR CONDITIONING!





3 New Remote Air-Conditioning Units!

 Model ACR-205 Economy Hi-Side
 2 h.p.

 Model ACR-340 Standard Hi-Side
 3 h.p.

 Model ACR-600 Standard Hi-Side
 5 h.p.

2 h.p. 20,500 BTU/hr. capacity 3 h.p. 34,000 BTU/hr. capacity 5 h.p. 60,000 BTU/hr. capacity

4 New Matching Evaporator Units!

Vertical Flow Coils—for use with counterflow highboy and lowboy installations.

Horizontal Flow Evaporator — for horizontal type furnaces; adaptable to highboy or lowboy installations.

A-Type Evaporator — mounted in plenum, for highboy, lowboy and counterflow installations.

Blower-Evaporator Package — used with matching hi-side unit to provide independent air conditioning system.

NEW HEIL SUMMER AIR CONDITIONERS

for residential and light commercial installation

Senors, here is famous HEIL quality and reliability in a brand-new line of summer air conditioners—designed for residential or light commercial installations...with cooling capacities from 20,000 to 60,000 BTU/hr...plus a profit-winning price range to suit virtually every need!

versatile!

For use with or without existing ducts — counter-flow, highboy, lowboy or horizontal winter air conditioners!

economical!

New air-cooled HEIL Summer Air Conditioners need no water connections! Low in cost, low in upkeep... fully assembled, completely self-contained ... with quick-disconnect fittings requiring no special tools!

quality built!

... to world-known HEIL standards for long-term, trouble-free operation . . . fully weatherproofed . . . completely leak-proof!



2 New Central Air-Conditioning Units!

Model SCH-200 \dots 2 h.p. Model SCH-400 \dots 3 $\frac{1}{2}$ h.p.

20,050 BTU/hr. capacity 40,000 BTU/hr. capacity



WRITE TODAY FOR FULL INFORMATION!

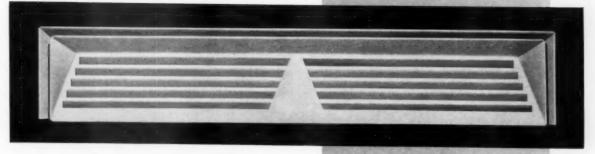
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SALES OFFICES: Union, N.J.; Atlanta, Ga.; Cleveland, Ohio; Chicago, Ill.; Milwaukee, Wis.; Kansas City, Mo.; Denver, Colo.; Dallas, Texas; Los Angeles, Calif.; Seattle, Wash.

Borg-Warner's welline diffuser outperforms other diffusers UP TO 10 FEET in length in

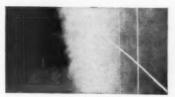
- HORIZONTAL SPREAD
- VERTICAL THROW
- BTU OUTPUT



The "Smoke Test" Proves Airline's All Covering Efficiency



Here the smoke indicates the formation of a curtain of air comfort along an outside wall.



Special streamlined boot properly distributes air from the branch duct to the diffuser face with low pressure loss.



Scientifically Designed . . . The One Most Suitable Size (24 inches) For The American Home.

Though designed for Borg-Warner's own heating and air-conditioning equipment, the Airline makes any forced air system perform better. The Airline delivers up to 12,980 Btu at 150 C.F.M. and 150° temperature at the register. With pressure loss out to an absolute minimum, the high center mass velocity projects 62° of air up to and across an 8 ft. ceiling at 150 ft. per minute. It is the only baseboard diffuser handling cold, heavier, dense air properly in summer besides fulfilling the requirements for efficient distribution of heated air in winter. It eliminates register roar, drafts, air bounce . . . and the diffuser's modern, streamlined contours blend into the baseboard.

A HEATING SYSTEM

A COOLING SYSTEM

ALL IN ONE PACKAGE

The New Diffuser is one part of a whole new Borg-Warner package. You can order all parts for a complete installation. Diffuser, boot, piping, plenum, and all types of heating and air conditioning units are available from Airline.



Airline

2 CONDITIONED AIR EQUIPMENT

760 E. Vine St., Kalamazoo, Mich.

Mr. Brown noted the progress being made in the development of zinc coated sheet. He pointed out that "many of the problems we had a year ago have been corrected or greatly improved."

In his talk on credit imformation for wholesalers, Robert D. Baggs, Dun and Bradstreet, Inc., had some interesting comments on business failures. He said, "The road to commercial failure is paved with the good intentions of amateurs in business. Capital helps a man to open the business, but know how keeps it open. More businessmen have difficulties from obvious management errors than from lack of operating funds."

"In these days of inflation," he pointed out, "one of the most common problems which shows up weak or incompetent management is the rising cost of doing business. When the time comes that the buyer's resistance requires a leveling off of prices, the incompetent drop like flies, because their first approach to the problem is the cutting of prices alone, without a single thought given to paring the expenses. How often have we seen this type of operator cut his own throat by pushing sales in such a market without realizing that every sale is increasing his final loss."

In his talk on "Peddling vs. Professional Selling" E. A. Terhune, president, Sales Development Institute, covered each phase of the sales presentation. The talk described methods used by various types of salesmen to insure initial attention and interest, to translate the features of the product and service into benefits to the buyer, to overcome objections and turn them into buying motives, to make the customer believe and to close the sale.

Toledo Association Changes Name

THE TOLEDO Warm Air Association has announced the change of its name to the Toledo Heating and Air Conditioning Contractors' Association. The association has started a series of full-page ads in a local newspaper advertising its members, the equipment they sell, and the group's new insignia.

Since the death of the association's secretary, Douglas Riblet, John M. Buckenmeyer has been the acting secretary.

Chicago Golf Season Begins

The first of the Chicago Warm Air Golf Association outings was held May 23 at River Forest Golf Club. Membership in the association is open to all members of the warm air heating industry in the Chicago area. The second outing will be during the week of July 8 at Itasca Country Club. The final outing will be in September at the Ruth Lake Country Club. Information concerning membership may be obtained from C. E. Price, Keeney Publishing Co., 6 N. Michigan Ave., Chicago 2.

Cuyahoga County Elects Officers

At the annual meeting of the Cuyahoga County (Ohio) Sheet Metal Contractors Association the following officers were elected: Gordon Justin, president; Joseph Knight, first vice president; William Patterson, second vice president, and Ray Quiggin, treasurer. Directors elected include: Irv Light, William Fingerhut, William Bordo, Manny Sheftel, Don Leavens, John Merker, Len Marshall, Robert Howard, Barney Appel, Rudy Landau and Dave Hirsch. Dave Gore, past president, is a member ex officio of the board.

The association has set up a vigorous campaign to secure a county wide warm air heating code, as well as a coordinated advertising campaign. All advertising will use the slogan "Does your home have a warm air register under every window?" Automobile bumper stickers using this slogan will also be available.

ARI Holds Annual Meeting

THE ANNUAL meeting of the Air-Conditioning and Refrigeration Institute was held at Hot Springs, Va., May 6-8. Featured speakers included: J. Lewis Powell, program coordinator, Office of the Assistant Secretary of Defense; Harry Bund, vice president, Research Institute of America; and Ernest Robert Rosse, world traveler, humorist, and philosopher.

Meetings of 13 product sections and two ARI committees were held during the three day session.

Detroit Hears Cooling Talk

THE MAY MEETING of the Detroit Warm Air Heating Association heard a talk on "Your Future in Residential Air Conditioning" by Pierce Burke, assistant sales manager, Weathermaker Dept., Carrier Corp. Mr. Burke gave dealers some important information on how to get started in the cooling field, the pitfalls to avoid, and the possibilities for growth and profits.

The association is continuing its efforts to obtain approval for the allotment of 80,000 additional permits for the use of gas for residential heating. The group has asked the Michigan Consolidated Gas Company to rescind permits which have expired and reassign them to new applicants. Members have been urged to support this campaign through letters to the Michigan Public Service Commission.

Kalamazoo Holds Annual Dinner

MEMBERS OF the Kalamazoo Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association attended the group's annual ham dinner in May. John De Haan was chairman of the event, assisted by Jim Newland, Louis Andrus, and Lyle Buttery.

(More association news on page 114)



Permaglas

the ONLY line with so many VALID SELLING

Through research ... a better way

A.O.Smith

Permaglas Div., Kankakee, III., International Div., Milwaukee, Wis.

CERAMIC COATING

High temperature ceramic-coated heat exchangers stop corrosion, end the rusting that always goes with condensation from summer cooling.

EXCLUSIVE MODULATION

Modulation with the Magic-Heet Control adjusts the gas flame to suit heating needs, puts an end to "on-off" heating. (Gas models only)

BALANCED HEATING AND COOLING

Heating and cooling units designed for each other. Heating units have fan capacity for cooling. Quick, economical cooling additions later.

STRIKING APPEARANCE

Styled for out-in-the-open use. Dimensioned for spaceconscious houses. Models and sizes for every heating and cooling application. Oil or gas.

ALL THIS IN A COMPLETE LINE

Permaglas is going places are YOU aboard?					
	A. O. SMITH CORPORATION Permagias Division, Kankakee, Illinois, Dept. AA-657 Gentlemen: Please send me complete details about Permagias Heating and Cooling				
	NameTitleTitle.				
	Company				
	Address				
	City				

As in the New Orleans City Hall

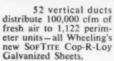
New Orleans, La.

get longer-lasting ducts with Wheeling SOFTITE° COP-R-LOY° Galvanized Sheets

28 large central air conditioning units and 1,122 small air handling units were needed for the new \$7½ million New Orleans City Hall. Mindful that the ducts should be as long-lasting and trouble-free as possible, Wheeling SOFTITE Cop-R-Loy Galvanized Sheets were used. These are the same type of copper-bearing sheets proved to last up to 33 times longer!

For full details, contact the Wheeling warehouse or sales office nearest you.





Wheeling SofTite Cop-R-Loy Galvanized Sheets were used for the 1,600 horizontal air distribution sections plus 62 vertical shafts.



WHEELING CORRUGATING COMPANY
WHEELING, W. VA.
IT'S WHEELING STEEL

Warehouses: Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Minneapolis, New Orleans, New York, Philadelphia, Richmond, St. Louis. Sales Offices: Atlanta, Houston,

PENN



Note roomy interior and clean, uncluttered design of Type 682 for intermittent ignition. Type 680 is for continuous ignition.



OIL BURNER CONTROL

with low voltage protection plus automatic recycling!

additional features you'll like...

- Easier to wire . . . extra ground terminal.
- Extended time-ignition period.
- Sealed safety and ignition time mechan-
- Protection against low voltage.
- Unusually compact . . . easily adapts to small or large diameter stacks and limited mounting spaces.
- Extra sturdy, durable enclosure with longlasting, attractive finish.
- Easily accessible finger-tip control of air adjustment.
- Plus many more you'll appreciate.

Here's a Stack Control that combines in one unit all the important oil burner control features known today! It has low voltage protection . . . automatic recycling with timed purge period . . . plus many more that assure dependable and safe performance for years and years.

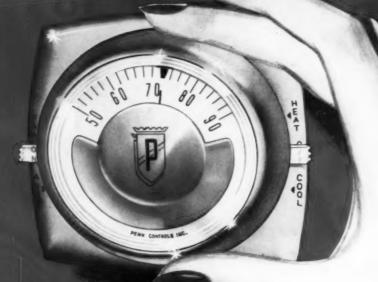
Distinctively styled, the Penn Stack Control is smaller outside yet roomier inside. It is built for use on continuous or intermittent ignition residential oil burners and small commercial jobs. It is easily mounted in the stack, heat exchanger or suitable location where temperatures will not exceed 1,000°F.

Try the Penn Stack Control on your next heating job ... you'll discover that your customers are more satisfied ... that costly, profit-eating service call-backs are a thing of the past . . . that you'll sell more, make more!

Learn more about this oil burner control that "stays on the job" longer. Ask your wholesaler, burner manufacturer or write Penn Controls, Inc., Goshen, Indiana.

AND THERE'S MORE FOR YOU

PENN'S NEW RIMSET ROOM THERMOSTAT



...has that "Fine Instrument" feel, look, quality, performance and is

TODAY'S EASIEST-TO-READ THERMOSTAT



The adjustable heat anticipator and all wiring is on sub-base where large terminals are easily accessible.

Never before have so many selling advantages been put into one room thermostat. It has everything to make your customers "buy" and keep them "sold"!

It adds beauty to any room with a distinctive look that's at home in any home. It maintains true living comfort with accurate regulation of indoor temperatures. It gives new convenience with the RIMSET dial. Just dial the rim to temperature desired . . . the extra large dial face remains stationary to make it today's easiest-to-read thermostat!

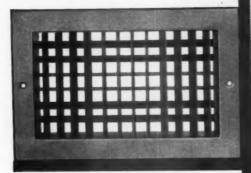
And, with the Penn RIMSET, various sub-bases are available for cooling, beating or any combination... the RIMSET thermostat unit fits them all! Thus, if cooling is added later to a heating installation... simply change the sub-base and use the same thermostat. There are many more selling advantages. Investigate Penn Controls... they "stay on the job" longer.

PENN CONTROLS, INC.

EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.

AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

What makes WATERLOO the buy-word in grilles?



Style 2V Supply Grille
Two sets of adjustable louvres,
front vertical, rear horizontal.



Style 3H Return Air Grille
One set of horizontal fins fixed down at 45° deflection... Also available in 0° deflection.

55 YEARS' EXPERIENCE

Since 1902, the Waterloo Register Company has been a leader in the development of registers and grilles for air conditioning, heating and ventilating applications. This 55 years of experience helps us make the finest equipment available today.

EXCLUSIVE DESIGN

Waterloo registers and grilles feature the silent flow "tear drop" louvre design, which allows a streamlined flow of high-velocity air, maintaining the required throw at the most efficient level.

QUALITY CONTROL

Every Waterloo register and grille is manufactured in a modern plant using the most efficient manufacturing techniques. There is rigid inspection at every vital step.

WIDE RANGE LINE

Whatever your specific needs, you will find the unit you want in Waterloo's complete line of supply and return registers and grilles. We also manufacture quality volume control dampers and door ventilators.

FAST SERVICE

Waterloo delivers . . . when you need it! Specials can be turned out in a hurry to meet job requirements.

These are five good reasons why it pays to make Waterloo your buy-word.



WATERLOO REGISTER CO., INC.

WATERLOO, IOWA

WR 10

REGISTERS . GRILLES . VOLUME CONTROL DAMPERS . DOOR VENTILATORS

Seek Trade Agreement In Dayton

EFFORTS to solve a dispute between Dayton plumbers and heating dealers have been undertaken by the Dayton Heating, Air Conditioning, Sheet Metal, and Roofing Contractors Association. The dispute involves the right to do gas piping on heating jobs. A meeting was held in March with the plumbers' organization; however no agreement was reached.

The plumbers organization has sued the City of Dayton in an attempt to have the courts clarify the ordinance covering such work. The heating contractors association has filed an intervening petition requesting an interpretation of their rights under the warm air heating contractors licensing law. The Dayton association, however, is urging settlement of the dispute outside of the courts to save the time and money of a court battle.

Wholesalers Attend School

A NUMBER of members of the National Heating and Airconditioning Wholesalers, Inc., attended the Wholesale Management School at Ohio State University, Columbus, Ohio, June 9-15. The school is sponsored by the National Association of Wholesalers. Among subjects covered at the meeting were sales, operations, personnel, financial management, labor relations, and essentials of management. Several sessions were devoted to business case studies and problem solving.

Alabama Meeting Held This Month

THE THIRD annual convention of the Roofing, Sheet Metal, Heating and Air Conditioning Contractors Association of Alabama was held June 6-8 in Montgomery. Bill Wright, newly elected president of the association, was general chairman of the meeting. Mr. Wright had been named president earlier by the board of directors to fill the unexpired term of Jack Halfacre, who resigned. The convention provided contractors with the latest information relative to all aspects of the industry.

Hold Party for Apprentices

A PARTY for all sheet metal apprentices was held in Kansas City in connection with the apprentice completion ceremony. Wives were invited to attend the dinner party by the apprentice committee.

Exhibition to Top 1955 Show

WITH FIVE MONTHS still to go before the 10th Exposition of the Air-Conditioning and Refrigeration Industry is held in Chicago's International Amphitheatre next November 18-21, Committee Chairman R. H. Israel reported that space sales have already reached the level of the last

show held in Atlantic City in 1955. As a result of the large demand additional space has been acquired for exhibitors.

Virtually every item known to or allied with the industry — from the tiniest valve to a mammoth multiton unit — will be displayed at the show.

Columbus Considers Paid Secretary

A COMMITTEE appointed by Lee Jones, president of the Heating, Air Conditioning and Sheet Metal Assoication of Columbus, Ohio, has investigated the possibility of hiring a paid secretary to handle association affairs. The committee's report is under consideration.

At the May meeting members heard a report from Ray Quiggin, president of the Cleveland Heating and Air Conditioning Dealers Association, on the certified heating program sponsored by that group.

Coming Events

June 24-26 — American Society of Heating and Air-Conditioning Engineers, semiannual meeting. Manoir Richelieu, Murray Bay, Que. A. V. Hutchinson, executive secretary, 62 Worth St., New York 13.

July 11 — Chicago Warm Air Golf Association tournament. Itasca Country Club, Itasca, Ill. Mel Johnson, president.

Oct. 7-9 — American Gas Association, annual convention. Kiel Auditorium, St. Louis, Mo. C. S. Stackpole, managing director, 420 Lexington Ave., New York 17.

Nov. 14-16 — American Society of Refrigerating Engineers, semiannual meeting. Shoreland Hotel, Chicago. R. C. Cross, executive secretary, 234 Fifth Ave., New York 1.

Nov. 18-20 — National Heating & Airconditioning Wholesalers, Inc., annual convention. Hotel Morrison, Chicago. W. R. Bull, executive director, 1200 W. Fifth Ave., Columbus, Ohio.

Nov. 18-21 — Air-Conditioning and Refrigeration Industry, 10th exposition. International Amphitheater, Chicago. Air-Conditioning and Refrigeration Institute, 1346 Connecticut Ave., N.W., Washington 6, D.C.

Nov. 19-22 — National Warm Air Heating and Air Conditioning Association, annual convention. Hotel Morrison, Chicago. George Boeddener, managing director, 640 Engineers Bldg., Cleveland 14.



Now...an extra capacity HOLGUN® geared to speed up tough jobs!

New B&D 3/8" Heavy-Duty HOLGUN is **POWER-BUILT** for tremendous torque

The new Black & Decker 3/8" Heavy-Duty Holgun is specially geared and powered for your tougher jobs. Yet it's compact enough to work in close quarters. And, for all its extra capacity, it's small enough to be carried in a tool kit.

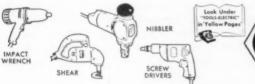
Ideal for continuous, non-stalling performance,

augers, 1/2" masonry bits and 11/2" hole saws. You have your choice of 1,000 r.p.m. standard speed or 600 r.p.m. optional speed.

Try this handful of power at your nearby Black & Decker distributor. You'll find him listed in the Yellow Pages of your phone book. For detailed information on the world's most complete line of portable electric tools, write for free catalog No. 10 to: The Black & Decker Mfg. Co., Dept. 1606, Towson 4, Maryland. (In Canada: 80-86 Fleet St., E., Toronto 2, Ontario).

this handy drill drives up to 3/8" twist drills, 3/4" wood

Leading Distributors Everywhere Sell





Portable Electric Tools—Power-Built to set the pace

THREE STAGE GEAR REDUCTION and low speed create tremendous torque in this handy drill.

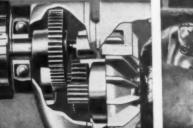
MASONRY DRILLING, demanding a tool that holds speed under load, is clean and fast with this drill.



PISTOL GRIP DESIGN, unique in a drill of this capacity, is perfect for close-quarter work



MONEL AND STAINLESS STEEL drilling are good applications for the low speed unit.







EQUIPMENT DEVELOPMENTS

The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For additional product information which is available, see this month's New Literature department

Remote and Self-Contained Units

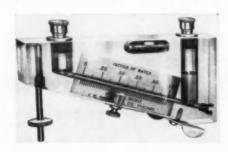
Models RC-B remote and ACP air cooled self-contained cooling units for residential and light commercial applications—American-Standard Air Conditioning Div., Dept. AA, 40 W. 40th St., New York 18.



Model RC-B is in 2, 3 and 5 hp sizes, consists of evaporator, blower and filter package designed for use with model AC-A outdoor air cooled condensing unit. Evaporator blower may be suspended independently, inserted into warm air duct work or installed with its own duct system. Packaged model ACP is in 2 and $3\frac{1}{2}$ hp sizes, equipped with dual compressors. Blowers provide up to 1600 cfm. Glass fiber duct kits are available.

Air Volume Gage

AIR VOLUME GAGE engineered to help dealers match actual performance of new cooling installations with factory performance ratings—F. W. Dwyer Mfg. Co.,



Dept. AAC, P.O. Box 373, Michigan City, Ind. Instrument indicates volume of air flow by measuring static pressure differential across evaporator. Installer can adjust blower speed to conform to manufacturer's recommended air flow. Gage is $6\ 3/16\ \times\ 4\ \times\ 1$ in., made of solid transparent plastic block with rubber tubing, connectors and metal static pressure tips. A

3 in. scale registers static pressure differentials in hundredths-of-an-inch water column.

Solenoid Gas Valve

Model K-3H solenoid gas valve with all working parts in hermetically sealed, liquid filled head—General Controls Co., Dept. AA, 801 Allen Ave., Glendale



1, Calif. Compact unit can be mounted in any position on horizontal pipe. Bleed line is eliminated. Unit can be used with all gases on all types of equipment, the company states.

Perforating Unit

"Unipunch" series B-5 perforating unit which punches round and shaped holes up to $3\frac{1}{2}$ in. in diameter in mild steel up to $\frac{1}{8}$ in. thick—Punch Products Corp., Dept. AA, 3800 Highland Ave., Nigara Falls, N.Y. Holder is 5 in. wide, made of lightweight aluminum alloy casting with steel insert in guide hole. Unit has $5\frac{1}{2}$ in. shut height and 2 19/32 in. die height. Holders maintain alignment of punches and dies and hold concentricity between punches, dies and pilot pins. Die block is removable; punch tips are interchangeable. Units are in 8, 12 and 16 in. throat depths.

Gas-Fired Water Heaters

"Demand Rated" line of "Rheemglas" gas-fired water heaters in 30 gal models—Rheem Mfg. Co., Dept. AA, 7600 S. Kedzie Ave., Chicago 29. Increased input is designed to provide more rapid recovery than previous (Continued on page 120)

ANEMOSTAT Announces....

ALL-AIR

CONSTANT VOLUME

HIGH VELOCITY UNITS



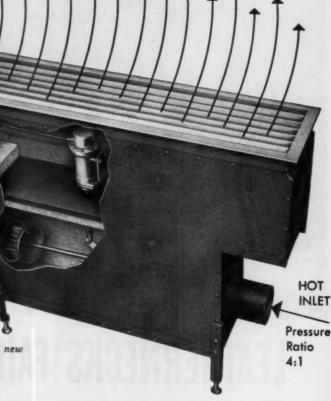
Pressure Ratio 1:4

Here is a vitally important advance in the field of air distribution. Anemostat All-Air High Velocity units, with new simple automatic controls, deliver constant volume, no matter what the fluctuations from 1:4 or 4:1 on inlet pressures of either the hot or cold valve.

Each unit is a single package including the controls and integral thermostats if required. There is complete accessibility of all controls through removable diffusers. No access panels are required. Capacities of CONSTANT VOLUME units can be pre-set at the factory.

These Anemostat CONSTANT VOLUME units

- · Assure scientific draft-free distribution of air.
- · Are available in 100% induction units.
- Include Anemostat die-cast metal rocket-socket valves. More than 50,000 of these valves are in service, and not a single one has needed maintenance.
- Operate on standard 15 lb positive acting compressed air systems.



See your nearby Anemostat representative for complete details on these revolutionary Anemostat All-Air CONSTANT VOLUME High Velocity units.

Anemostat: The Pioneer of All-Air High Velocity Systems

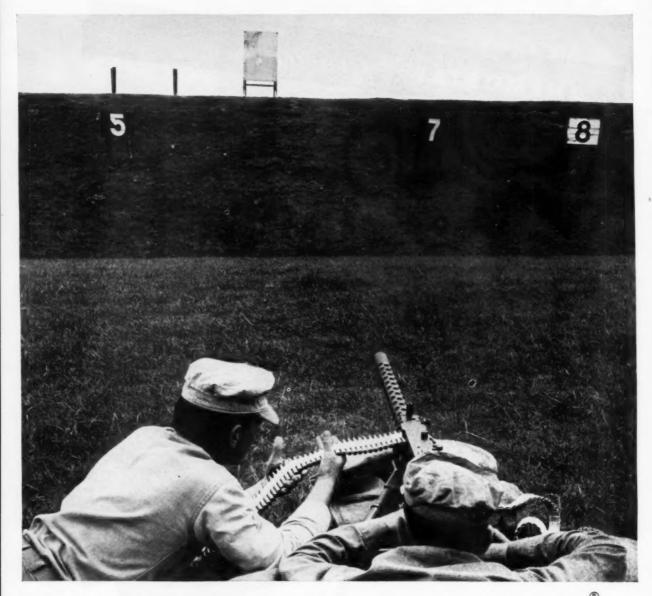
MOSTATE

DRAFTLESS Aspirating AIR DIFFUSERS

ANEMOSTAT CORPORATION OF AMERICA

10 EAST 39TH STREET, NEW YORK 16, N. Y.

Representatives in Principal Cities



LEATHERNECKS FAIL TO FLAKE TI-CO



Close-up inspection of the bullet holes in TI-CO. Not one sign of coating failure.

Two husky Marines teamed up with a Browning .30 caliber machine gun to pour two hundred rounds of armorpiercing ammunition into a sheet of Inland TI-CO galvanized steel.

Despite the smashing contact of slug after slug, TI-CO showed not a crack, not a chip, not a trace of peeling or flaking. The protective zinc coating on TI-CO stayed put...to the very edge of the holes.

If speeding bullets fail to flake TI-CO...you can be sure that even the most severe fabricating operations or the roughest, toughest handling will not flake TI-CO's coating. That means positive protection for the base metal. No chance for rust to get a foothold.

"I'm a great fan of Inland TI-CO galvanized steel sheets,"

says Howard Houchens, Sheet Metal Contractor on the new Indiana Turnpike



The Indiana Turnpike job is one of the largest single projects Apex Heating & Ventilating Company has ever undertaken. Each station consists of two large buildings, one on each side of the highway. Each building houses a gas station, a gift shop and a complete restaurant. The entire installation required 65 tons of galvanized sheets. And it's all Inland TI-CO.

"We specified Inland TI-CO for the duct work and air handling equipment because it's dependable," says Mr. Houchens. "Its non-flaking quality keeps our labor costs down. With TI-CO, fabricating time in the shop is reduced to a minimum because there are no make-overs due to peeling of the zinc or splitting of the sheets, and machine down-time caused by zinc clogging is eliminated. Most important, TI-CO provides a more attractive, longer-lasting finished installation."

TI-CO is available in cut sheets or coils, in gages 8 to 30 inclusive and widths as great as 60 inches. TI-CO comes with dry, oiled or chemically treated surfaces. Consult your local steel distributor or Inland representative for your requirements.

TI-CO Galvanized Sheets are now readily available!

The terrific demand for this high quality sheet has kept TI-CO in short supply since its development. Now, additional production facilities have been completed making greater quantities available.

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport St. Louis • Kansas City • Indianapolis • Detroit • New York



This is a housing for one of the air handling units being installed in a Turnpike building. On large prefabricated parts such as this, TI-CO's non-flaking feature pays off. They come out right the first time. No "do-over" operations because of peeling, cracking, or flaking along seams—no waste of materials. Thanks to TI-CO... no man-hours lost, in the shop or on the job!



Look for this brand your assurance of non-flaking performance (Continued)

models. Line consists of three models: "Holiday," "Imperial," and "Fury." "Demand Rated" seal will be affixed to jacket near nameplate.

Clip Punch

Model 300-5 heavy duty clip punch with capacity of three sheets of 18 ga metal or 2 sheets of 16 ga metal —Thor Tool and Die Co., Dept. AA, 865 Estabrook



St., San Leandro, Calif. Unit is said to push ear or lip through overlapping sheets. It will work on 1 in. or larger standing seams in corners or narrow spaces, the manufacturer reports.

Cooling Tower

"JET ACTION" cooling tower using system of waterjet nozzles to force air through tower, eliminating fans, motors, belts, pulleys and bearings—Koch Engineering Co., Dept. AA, 321 W. Douglas, Wichita, Kans. Nozzles spray downward, causing movement of air



through tower and atomizing the water to improve mixing of air and water without wood slats and baffles. Unit is plastic and plastic coated, can be placed outside. Design is columnar; plastic finish can be painted to match surroundings.

Machinery Mounting

"WAFFLE-GRIP" machinery mounting and vibration and noise control pads—Korfund Co., Dept. AA, 48-01 32nd Pl., Long Island City 1, N.Y. Pad consists

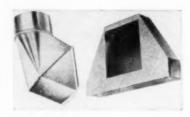
of layer of resilient cork permanently bonded between two layers of oil-resistant neoprene embossed in waffle pattern. Standard capacity models are for loads to 60 psi; high capacity models are for loads to 120 psi. Cross-rib construction is designed to increase pad deflection and provide all-direction resistance to machine movement. No bolting is required, the company states.

Gas Pressure Pilot Regulator

Model H-100 Gas pressure pilot regulator, applicable to any pilot light where controlled gas pressure is present—Major Controls Co., Dept. AA, Highway 71 and Yorba Rd., P.O. Box 537, Corona, Calif. Unit is said to be suitable for all gases up to 14,000 Btu capacity at 3/10 drop per hr. It has maximum 2 in. flange width, is 2½ in. high, weighs 4½ oz and has port sizes of ½ and ¼ in. Regulator is made of lightweight aluminum with integral cast guideposts for location and seal of neoprene impregnated nylon diaphragms. Featured are variety of vent connections, wrench and vise-grip bosses.

Pre-formed Duct, Fittings

PRE-FORMED ROUND duct and fittings for perimeter heating systems—Duc-Pac, Inc., Dept. AA, Baldwin St., East Longmeadow, Mass. Designed to reduce num-



ber of sizes and shapes required, fittings have been reduced to two basic units: universal takeoff and universal box, to enable dealer to standardize layouts, inventory and installation work. Fittings are pressed together to form joints, the manufacturer explains.

Turbine Ventilator

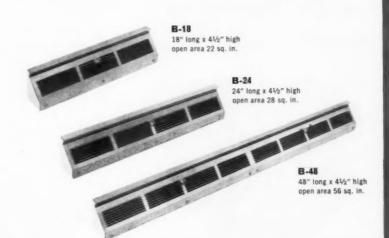
"Centriflo" turbine ventilator with ground deep groove ball bearing mounted in self-aligning, shielded bearing housing—Greenheck Fan & Ventilator Corp., Dept. AA, Schofield, Wis. Bearing has basic load rating of 300 lb. Housing is designed to permit bearing to run freely with no binding due to misalignment. Rotor is aluminum. Rotating unit and bearings are suspended in rubber.

Portable Electric Drills

Three portable electric drills in $\frac{1}{2}$, $\frac{5}{6}$, and $\frac{3}{4}$ in. sizes, in heavy duty ($\frac{1}{4}$ and $\frac{5}{8}$ in.) and standard

new! in 3 sizes! weatherproof comfort for two-way systems!





STANDARD B SERIES PERIMETER BASEBOARD DIFFUSERS



new setlock damper control built-in damper



face can be removed easily at any time



adjustable boot opening no cutting or fitting required



one-piece back construction keeps walls clean (no smudging)

comfort

- cleaner, quieter operation, because of angled fins and more open area
- · easier installation in new or old construction
- · uniform air distribution around outer walls
- · noticeable temperature differential, floor to ceiling
- · constant air circulation
- · no blasts, no hot spots, no cold corners



plus style

STANDARD REGISTERS & GRILLES

at attractive

Standard Stamping & Perforating Co.
3137 W. 49th Place, Chicago 32, Illinois
Please send your new free catalog.

Please send your new tree catalog

Name_____

Address

City_____State____

Sell Carrier Unit Heaters with "Hearts of Aluminized Steel"



give your customers the extra value that produces repeat business

Carrier Gas-Fired Unit Heaters—with Hearts of Aluminized Steel—give your customers good reason for doing business with you again and again!

Carrier's all-welded heat exchanger of 16-gauge Aluminized Steel far outlasts heavier gauge furnace steel and ceramic coated metals. It insures extra years of dependable, trouble-free service. Special Carrier engineering features cut operating expenses. And fine cabinet design permits these Carrier units to be installed in retail stores, offices and schools as well as industrial buildings.

Carrier Gas-Fired Unit Heaters are available in 8 sizes: 50,000 to 230,000 Btu/hr. Duct furnaces in 7 sizes: 70,000 to 230,000 Btu/hr. Look in your Classified Telephone Book for the name of your nearest Carrier wholesaler. Start selling the line that produces repeat business—Carrier!



INDUSTRIAL HEATING
AIR CONDITIONING — REFRIGERATION

equipment developments

(Continued)

(3/4 in.) models—Black & Decker Mfg. Co., Dept. AA, Pennsylvania Ave., Towson 4, Md. Units are said to have more power than predecessors, three-position built-in reversing mechanism drives, positive key drive chuck. Gears subjected to hardest wear are specially treated for hardness. Chuck is self-aligning and removable. Taper sockets are available.

Ceiling Diffusers

Models 76 flush style and 77 step down wide ring ceiling diffusers and model 90 square ceiling diffuser in step down style—Air Control Products, Inc., Dept. AA, Coopersville, Mich. Models 76 and 77 consist of



wide concentric rings with anti-smudge outer ring, self-sealing gasket at duct connection, push-pull rod-operated damper with butterfly valve. Both models are in 6, 8, 10, 12, and 14 in. sizes. Model 90, in 6, 8, 10, 12, 14 and 18 in. squares, has same features.

Replacement Filter

"FIBERSCREEN" one-size filter replacement material for all window and room cooling units—Fiber Bond Corp., Dept. AA, 2237 S. LaSalle St., Chicago. Made from bonded "Dynel" acrylic fiber produced by Union Carbide and Carbon Corp., filter has stiff cotton mesh backing which eliminates need for supporting frame yet permits cutting to correct size, and provides more filtering area because frame is eliminated. Material is said to catch particles all the way through the filter rather than on front surface, to permit free flow of air. Heavy duty filters in 1 and 2 in. thicknesses are available.

Semi-Automatic Welding Unit

SEMI-AUTOMATIC submerged are welding unit for operation on 110-v, a-c or d-c—Hobart Bros. Co., Dept. AA, Canal Lock Sq., Troy 1, O. Gun cable assembly is included with two welding guns which are interchangeable; one is flux type with hopper, the other an open are type for welding without flux. Unit has caster mounted base and carrying handles, wire reel with speed control rheostat and wire straightener.



POWERFUL REASONS WHY A CHEVROLET STAYS ON THE JOB... SAVES ON THE JOB!

FAMOUS CHEVY 6

(America's most popular truck engine)

- . Fuel-saving 8 to 1 compression ratio
- Low-maintenance valve-in-head design
- · Two fuel filters for dependability
- · Durable alloy steel exhaust valves
- · High poweroutput ignition



· Economical bypass cooling

Chevrolet trucks offer the world's most popular truck engines-big 6's, designed soundly yet simply to provide plenty of power at lowest cost and the ability to keep going in rugged service. Like all Chevrolet truck components, these engines put the accent on economy and dependability!

Chevy's the dollar saver de luxe of the American road, and many of the reasons why can be found beneath the Chevrolet truck hood. That's where you'll often find one of the great 6-cylinder powerplants that have pulled more payload more miles than any other engines in the history of hauling. They're honest-to-goodness truck engines, specially built to stay and save on the roughest and toughest of hauling jobs. Or, if you prefer a V8, the ones that hum beneath the Chevy hood are at the head of their class for fleet-going short-stroke V8 efficiency.

You'll find that a Chevrolet truck gives you so much to save with! Your Chevrolet dealer is waiting to fill you in on all the facts. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Biggest sellers . . . because they're biggest savers! CHEVROLET



CHEVROLET TASK-FORCE 57 TRUCKS

equipment developments

(Continued)

Head can be removed for remote operation in close quarters.

Exhaust, Duct Fans

Direct and belt drive exhaust and duct fans with single or three phase motors and standard voltages



-Peerless Electric Co., Fan and Blower Div., Dept. AA, 1401 W.

Market St., Warren, O. Direct drive exhaust fans are for exhausting air or ventilating restaurant kitchens, laundries, etc. Belt drive units move air at low noise level, for attics, homes or stores. Motors are enclosed with full ball bearing construction for continuous operation. Belt drive duct fans are for paint spray booths, industrial ventilation and air exhaust. Diameters match standard duct sizes. Drive and motor are isolated from air stream. Unit can be mounted in any position.

Fan-Compressor Control

Model F 17 control which operates fan and compressor of cooling unit with a single dial knob—Ranco, Inc., Dept. AA, 601 W. 5th Ave., Columbus 1, O. Rotating the knob from "off" position first switches on the fan while secondary positions operate the compressor. Dial range is up to 25 deg; featured is minimum 4 deg differential using vapor-pressure element, or a 4½ deg differential with

cross-ambient element. Both switches are single pole, single throw.

Vacuum Cleaner

Model HP-2 "Super" commercial furnace vacuum cleaner designed for protection against container damage from corrosive liquids in wet pickup or transfer operations—National Super Service Co., Dept. AA, 1944 N. 13th St., Toledo 2, O. Designed for attractive appearance, unit is made of glass and fiber material which resists denting. Transport handle also facilitates emptying.

Blueprint Holder

"DATA-FILE" vertical filing rack for blueprints and large floor plans—
Plan Hold Corp., Dept. AA, 5204
Chakemco St., South Gate, Calif.
Horizontal, adjustable-length arms grip plans at one edge, allow them to hang downward at full length or folded, for quick access. Friction type binders eliminate need for holes.





From Wichita, Kansas, where the summer sun turns houses into ovens, comes another report on Rheemaire home air conditioning. This time from Murrel H. Stark, owner of Stark Sheet Metal Co., who found:

"RHEEMAIRE ends costly service calls—put me back in the air-conditioning business!"

"Believe me, I mean that!" stressed Mr. Stark. "A year ago I was fed up—all set to chuck air conditioning. One expensive service call right after another gobbled up all my profits.

"When Rheemaire came out, though, I decided to give it a chance. You see, I've been a Rheem heating contractor for 16 years now. And in all that time, I've had practically no trouble with Rheem furnaces.

Delivers maximum coolinganywhere

"Well, my hunch paid off. To date I've sold a couple of truck loads of Rheemaire systems. And, you know, I haven't had one service call yet that's cost me money.

"My customers? They're as happy about Rheemaire as I am. No matter how big the house, how hot the weather, they're getting perfect results—at an extremely low operating cost, too!"

Cuts costs almost 1/2

You may think Mr. Stark hit a lucky streak. But if so, bear in mind that what he's told you is happening to contractors all over the country. Rheemaire's different—that's why. For two very important reasons: Not only is it easier, faster to install—but it cuts operating costs almost in half!

You can install Rheemaire all by yourself. Refrigerant lines come from Rheem already charged and equipped with special quick-connect couplings. So there's no system evacuation. No charging. No sweat connections. Your customers enjoy a much lower operating cost because Rheemaire delivers up to 95% more cooling capacity per compressor h.p. For example, a 1 h.p. compressor—teamed with the exclusive, new Air-Film Condenser—gives 1.85 tons of

cooling. And Rheem backs that rating with a \$1,000 capacity guarantee!

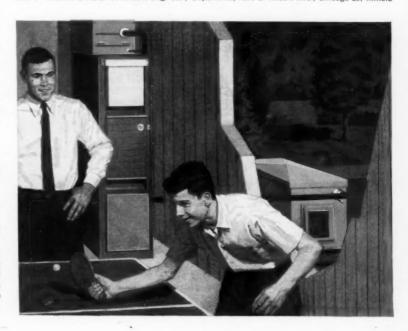
During a single two-week period recently, Mr. Stark sold 13 Rheemaire systems. Isn't it high time you got full details on revolutionary Rheemaire? Write for your free booklet.

YOU CAN RELY ON



THE BIG NAME IN COMFORT PRODUCTS FOR THE HOME water heaters, warm-air furnaces, wet-heat bollers, plumbing fixtures, water softeners

Home Products Division of Rheem Mfg. Co. / Dept. AA13, 7600 S. Kedzie Ave., Chicago 29, Illinois



DURO DYNE

"JUNIOR" FLEXIBLE DUCT CONNECTORS



Lowest cost, pre-assembled flexible duct connector for residential installations. Dimensions: Metal 2"; Fabric 14"; Metal 2".

Think of it! Vibration noise can now be eliminated for less than \$2.00 per installation!

Duro-Dyne's "Junior" Flexible Duct Connector does it.

And it provides all these important advantages as well:

- Pre-assembly permits fabrication 3 times faster than conventional methods! Cut it . . . fold it . . . install it!
- Exclusive Double-Loc seam assures that metal and fabric will not part even under severe braking.
- · Fabric is U. L. approved canvas or asbestos.
- Unique, easy-to-handle dispensing cartons carry 50 feet or 100 feet coils.
- Fabric seam closes quickly and positively with Duro-Stapler.
- Meets Federal specification CCC-D-746 and Military specifications MIL-D-10860.

Your local Duro-Dyne distributor can give you a complete demonstration quickly. Call him today, You will spend a very profitable 30 minutes. Or write now for a sample of "Junior" and the name of your local supplier.

The greatest name in sheet metal specialties



DURO-DYNE CORP., 800 Third Ave., New Hyde Park, N. Y. CANADIAN DISTRIBUTORS: Douglas Engineering Company, Ltd., Montreal and Toronto E. H. Price, Ltd., Winnipeg and Vancouver

equipment developments

(Continued)

Racks for manuals, specifications, etc. and rolling stand unit are also available to attach to plan rack.

Gas Burner

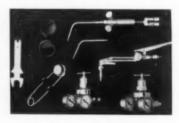
Model G-200 power inshot gas burner with input range of 80,000 to 200,000 Btuh—Nu-Way Corp., Dept. AA, 2416 Fourth St., Rock Island,



Ill. Featured are: accessible panel construction; cast iron venturi with adjustable primary air gate which proportions total air volume into primary and secondary air; adjustable input rate by changing orifices; centrifugal switch which shuts off main gas valve when blower is not up to normal speed; pilot safety device; non-aerated single port pilot.

Welding, Cutting Outfit

LIGHT DUTY welding and cutting outfit for welding, brazing, heating and cutting operations—Air Reduction



Sales Co., Div. of Air Reduction Co., Inc., Dept. AA, 150 E. 42nd St., New York 17. Unit is said to weld metals up to 3/16 in. thick and cut steel plate up to 1 in. thick. Outfit includes two single stage regulators, twin 3/16 in. gas hoses, welding torch with mixer and two tips, and cutting attachment with one tip. Wrench, sparklighter and goggles are also included. Torch and cutting attachment weighs 19 oz; length is 1½ in.



Get ON TOP of the WORLD

with LILAMAZOO Warm Air Conditioners

Full Gas, Oil and Coal line

Respected Name

"King Octagon" is proud to bring you a 6-Point Program that is unsurpassed in America today! You can't afford *not* to get all the details on Kalamazoo's quality line of gas, oil, and coal-fired warm air conditioners through this Program.

Join those successful distributors and dealers who know the value of handling Kalamazoo — a name known and respected for the finest in heating since 1901.

Phone . . . Wire . . . Write Now!

Kalamazoo	Furnace	& Appliance	Mfg. Co.
100 Roches	ter Ave.,	Kalamazoo,	Michigan

- Please have your salesman present King Octagon's 6-Point Program.
- Give me the full details by mail.

Name

Company.

Street_ City_

Zone___State









1/2: LAN/AZOO

FURNACE & APPLIANCE MFG. CO.

Since 1901—the finest in heating equipment

ROCHESTER AVE.,

KALAMAZOO, MICHIGAN

For Commercial Installations



Independent famous "Fabrikated" construction makes these grilles especially adaptable to large sizes for schools, hospitals, hotels, and other commercial buildings.

CHECK THESE FEATURES

- Vertical or horizontal bars strengthened by interlocking cross bars; no vibration.
- Tamper-proof. Changes in air distribution cannot be made by unauthorized persons.
- Mesh (% x 111/s) filters 72% of free area yet darkens the duct and reduces highlights from back of the grille.
- 14 gauge steel solid bars ½" deep—strong enough to be "kick-proof"—(a must for schools).
- All bers made from round edge stock. No sharp edges. (A must for schools).
- The only grille for taking abuse in school gyms and hospital psychopathic wards.

These grilles are unusually rigid-strong and exceedingly resistant to impact—the best that money can buy. We make them in any size. Sendy our specifications. We are prepared to give immediate service because we always stock grille parts for any size.

THE INDEPENDENT REGISTER CO.

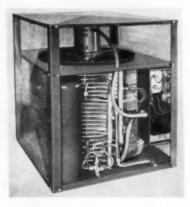
3747 E. 93rd STREET . CLEVELAND, OHIO

equipment developments

(Continued)

Remote Cooling Unit

RESIDENTIAL AND commercial cooling units with "Beehive" circular coil condenser said to have more than 12½ sq ft of prime coil surface—Miami Products, Inc., Dept. AA, P.O. Box 1029, Miami, Okla. One-row



coil is said to decrease amperage draw 10 percent. Unit can use blade type fan because of lack of static resistance, the company reports. Units are in 2, 3 and 5 ton models. Air cooled condensing unit is installed on roof or ground. Evaporator coils are adapted to counterflow, highboy and lowboy furnace installations.

Service Truck Body

"Service-Master" all-purpose service body designed for installation on ½, ¾, 1 and 1½ ton truck chassis —McCabe-Powers Auto Body Co., Dept. AA, 5900 N. Broadway, St. Louis 15. Tool storage space is weathertight and theft-proof, the company states. Compartments are 14½ in. deep; body cargo area is 48½ in. wide; overall width is 77½ in. Cargo area floor is heavy tread plate steel. Door hinges have nylon bushing to prevent binding. Other features: full length parts bin with removable dividers and hinged cover; additional bins with permanent dividers; recessed door handles; reinforced corners to accommodate overhead rack. Other optional equipment is available.

Gas-Fired Furnaces

FIVE CAS-FIRED furnace models in three sizes, rated at 80,000, 100,000 and 120,000 Btu input—Chattanooga Royal Co., Dept. AA, First and Delmar Sts., Chattanooga 6, Tenn. Two of the units have direct drive blowers capable of handling up to 2 tons of cooling. All models feature enclosed 24-v controls, slotted port burners, shock absorbent mounting channels, and removable or permanent filters.



Beautiful Answer to 101 Overhead Heating Jobs

"Morman Three Sixty"

FORCED CONVECTION OVERHEAD GAS HEATER

You'll like the way prospects like the ultramodern Norman Three-Sixty, and you'll appreciate its exclusive features that give you such a profitable edge on competition.

Here's how the Norman Three-Sixty assures constant air circulation without stratification. An intake fan draws air from the floor up into the bottom of the unit where the air is heated and distributed outward and slightly downward in a full 360° radius to form an umbrella of comfortable warmth.

- * Sealed Combustion System
- * Exclusive Electric Ignition
- * Forced Exhaust
- * 100% Outside Air For Combustion

The exclusive sealed combustion system with electric ignition lets you install the Three-Sixty where ordinary unit heaters can't go. The system also permits efficient and economical installation in multi-story buildings.

Find out why the Norman Three-Sixty offers you so much more in opportunity for increased sales and profits.

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products lorman company

Norman Southerner **Horizontal Gas Furnace**



Norman Conversion Burners Available with capacities from 50,000 to 2,000,000 BTU/h.

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	ils on the Norman Three-Sixty Fo is Heater and other quality Nor ent.				
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STEINEN Introduces New Complete Line of Draft Regulators 6" thru 32"

NEW DESIGN, NEW PACKAGING, NEW EXCLUSIVE FEATURES

Now . . . after three years of engineering research and development . . . a complete line of *Residential and Commercial Draft Regulators* that are vastly superior to any other make.

Features of the Residential sizes include One Calibrated Scale — from .02" to .08", permitting accurate horizontal, vertical or diagonal installation without changing parts and Push-Pull Slide Bar Control that provides automatic balance — greater sensitivity at every setting.

Features of the Commercial sizes include Locked-In True Balance as a result of exclusive Acro-Lok and the unique design and packaging that cuts weight by 20% and saves as much as 40% in space.

These are only four of the combined fourteen features that make it important that you investigate and compare this new line. Your own comparison will prove that there is no finer constructed, more efficient regulator on the market. Write for complete information today!

40% SAVING IN SPACE Here is dramatic evidence of the saving in space resulting from new unique packaging of all Commercial Models —20% lighter . . . cuts shipping costs.





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Draft Regulators • Oil Burner Nozzles • Nozzle Adaptors Kits & Strainers • Flame Mirrors • Electrode Assemblies
Copyright 1957 • W. S. C

equipment developments

(Continued)

Unit Heater

Model 25 UF, 25,000 Btu unit heater featuring compact construction— Utility Appliance Corp., Heating Div., Dept. AA, 4581 S. Alameda



St., Los Angeles 58. Unit is 16¾ in. high, 10½ wide and 21 in. deep. Heating elements are porcelain enameled; discharge louvers are adjustable; fan and limit controls are fully automatic. Pull-chain switch provides summer ventilation.

Cooling Slide Rule

SLIDE RULE for determining residential heat gain—International Heater Co., Dept. AA, 101 Park Ave., Utica 2, N.Y. Unit condenses data from

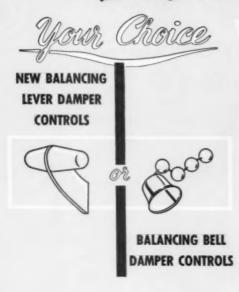


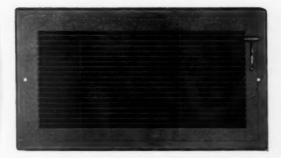
NWAHACA Manuall 11 into three slide rule settings. Calculator provides 48 calculations for any one house plan resulting from different combinations of construction, outside color and sun shading.

Masonry Anchor

"MULTI-CALK" masonry anchor with caulking sleeve for anchoring heavy equipment to masonry—Rawlplug

NOW Line REGISTERS GIVE YOU





"45" with lever

Complete Damper Control is as easy as pressing a lever or pulling a chain

80050h 000

- Can be pre-set to balance system without quadrant dampers
- Close damper tightly to assure positive air shut-off
- Open damper automatically to its balanced position



"45" with chain

New Lima Balancing Lever has same positive control as the famous Lima Balancing Bell. Simply move Lever Stop up or down to regulate degree of damper opening. Lock Lever Stop in place by adjusting set-screw in face of register. Damper then opens automatically to the balanced position at the touch of the lever.

All Lima Registers have solid, one-piece construction . . . all joints are welded for maximum rigidity. Face bars can be easily adjusted to any air pattern desired. All Lima Registers have a special finish . . . electrostatically applied for evenness, baked on for lasting beauty.

For sidewall registers . . . with either balancing lever or chain control . . . ceiling, baseboard and floor registers and diffusers . . . Lima gives you extra quality, at no extra cost.



LIMA REGISTER COMPANY

1786 N. CABLE RD., LIMA, OHIO

sold exclusively through heating wholesalers and manufacturers



Heat Pump Installation uses

SONOCO SONOAIRDUCT







The perimeter heating-cooling system for this \$30,000 residence included a GE Weathertron heat pump and economical Sonoco Sonoairduct fibre duct. Lightweight, long-length Sonoairduct was easy to handle and level, thus saving time, labor and money in installation. By mitering the duct, all T-joints were made Without metal fittings.

Sonoco Sonoairduct is made especially for gas and oil fired loop and radial perimeter, slab-floor heating systems where the duct is encased in dense aggregate concrete. It is aluminum foil lined. 23 sizes — 2" to 36" I.D., up to 50' long. Can be sawed to exact lengths on the job. Free installation manual available.

H. O. Woltz residence, Mount Airy, N. C. Robert M. Engelbrecht, A.I.A. Fulk & Needham, Inc., contractor. Floyd Pike Elect. Co., Heating Contractor. Masonry products by Badgett Concrete Products, Inc.

criteria and test re-

quirements for prod-

ducts in this category

See our catalog in SWEETS



SONOCO PRODUCTS COMPANY

CONSTRUCTION PRODUCTS DIVISION

HARTSVILLE, S. C.

LOS ANGELES, CAL. \$955 SOUTH WESTERN AVE. MONTCLAIR, N. J. 14 SOUTH PARK STREET

AKRON, IND. . LONGVIEW, TEXAS . BRANTFORD, ONT. . MEXICO, D. F.

equipment developments

(Continued)

Co., Inc., Dept. AA, 200 Petersville Rd., New Rochelle, N.Y. Caulking sleeve is precision cast of a special lead alloy developed for masonry anchors by the company. Anchor is designed for heavy duty application.

Gas-Fired Furnaces

"Master" and "Lifeguard" gasfired furnaces with increased air delivery capacities—Day & Night Mfg. Co., Dept. PR-AA, 700 Royal Oaks

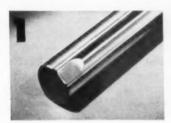


Dr., Monrovia, Calif. Units feature ceramic coated heating elements for use where condensation is a problem, and are designed to match the needs of modern cooling systems. Model 75/100 UFA-L is rated at 75,000 Btu input and has 1/3 hp belt drive blower with two speed motor, the company states.

Plastic Deck

STYRENE PLASTIC extended wetted deck surface in sheets up to 24 in. wide-Quick Plastics, Div. of Quick Industries, Inc., Dept. AA, 1602 Cooper St., Jackson, Mich. Designed for use as fill in cooling tower pack subject to combination water and air bath, material will not corrode or rot. It is extruded and vacuum formed in continuous rolls. Pattern allows for both counterflow and cross flow. Material may be stacked loose or cemented, then all thicknesses cut with hot wire at one time to fit pack. Frame is not necessary because of rigidity of the material.

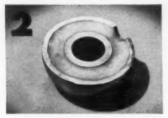
QUALITY YOU CAN DEPEND ON WHERE QUALITY COUNTS MOST



SIZED, GROUND, and POLISHED SHAFTING assures dynamic bal-ance, true bearing fit. Ask your Brundage representative to show you samples.



LUBRICATION BY GULF . . . famous Plastic "E" assures instant lubrication. It lasts for years and the big reservoir is re-fillable.



BEARINGS BY RANDALL . same quality bearings that are standard on America's finest equipment are part of every Brundage Blower.



EXCLUSIVE SELF-ALIGNING BALL & SOCKET. Lubricated retaining cushion relieves all lateral stress. makes Brundage the only really self-aligning unit in its field.

The focus is on service-free performance that builds your product reputation

Your blower becomes part of your product in your customer's mind. How well - and how long - it performs is of critical importance to your product reputation.

That's why Brundage builds unsurpassed quality into every blower, using the finest materials and workmanship where they count the most.

Creating this quality starts with the best available components at the blower's heart—the shaftbearing area. Here, Brundage finish and assembly are unique in the blower industry. The result is quiet, durable operation, designed to last the full life of your equipment.

And, best of all, Brundage quality costs no more. Measure the advantage in your own lab.

BRUNDAGE BLOWERS

THE BRUNDAGE COMPANY / 504 NO. PARK ST. / KALAMAZOO, MICHIGAN

GUARANTEED

- ... not for 5 years, not for 10 years
- ... not for 15 or 20 years, but

WHOONDITIONALLY DRANT



Zeph-Air is the gas furnace with the cast-iron heart. The entire heating element is unconditionally guaranteed

A limited number of exclusive franchises protect our dealers — and we assist them with many kinds of dealer helps.

Write today to see if a franchise is open for you. We'll give you the details you need and want - no obligation, of course. We'll also be pleased to furnish complete information on our air conditioning units for use with our heating equipment.

XXTH CENTURY

HEATING & VENTILATING CO.

Since 1894

AKRON, OHIO

equipment developments

(Continued)

Ceiling Diffuser Dampers

Models 78 round and 90 square ceiling diffuser dampers operated by push-pull rod-Air Control Products, Inc., Dept. AA, Coopersville, Mich. Both models fit 6, 8, 10, 12 and 14 in. diffusers; model 91 also



fits 18 in, square diffuser, Plastic operator knob can be removed to prevent tampering. Nylon friction bearing is said to reduce noise and hold butterfly valves in selected position. Tension springs minimize rattling. Damper ring screws directly to duct.

Flow Control for Press Brakes

"LET-UP CONTROL" with adjustable flow control valve for hydraulically operated press brakes, designed to eliminate whipping and kinking of sheets during forming-O'Neil-Irwin M/g. Co., Dept. AA, 501 Eighth Ave., Lake City, Minn. Ram speed can be reduced up to 50 percent just prior to time the die in the ram makes contact with material to be formed; while form part of the stroke is at slow speed, return stroke is at full speed. Adjustment is made on calibrated gage which controls valve to regulate hydraulic oil flow.

Air Filter Line

SERIES OF "absolute" type air filters designed for critical sub-micron ranges to 0.1 micron in diameter-Farr Co., Dept. AA, 2301 Rosecrans Ave., El Segundo, Calif. Capacities range from 30 to 5000 cfm. Units consist of deep, closely spaced folds of filter paper fitted into a rigid rectangular frame. Paper pleats are held securely in place by corrugated separators which permit air passage. Type I is for use in temperatures below 225 F and non-corrosive conditions; Types II and III are for use in temperatures up to 1000 F or corrosive atmosphere. Units are installed downstream of other filters in multibank system.

Baseboard Units

CONTINUOUS BASEBOARD diffusers with covers in lengths from 2 to 8 ft in increments of 1 ft-Embassy

96 IRA AVE.



for You

... and
every
one
a
perfect
fit



No Sir, no ready-made here. Emerson-Electric motors are custom-engineered for your product... designed for you, produced for you and priced for you. It is no longer necessary to design your product around a standard motor. Emerson-Electric engineers will work with you through every stage of development. You get the product you want with a motor that EXACTLY suits your purposes... a custom-engineered motor at standard motor prices. Call, wire or write Dept. M-60 today, The Emerson Electric Mfg. Co., St. Louis 21, Mo.

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Since 1890

A complete line

of America's finest

heating equipment



Fluid heat automatic HEATING EQUIPMENT

Conversion Burners

Winter Air Conditioners

Hi-Boy and Lo-Boy

Horizontal Furnaces

Gravity Furnaces

Counter-Flow Furnaces

Boilers

Hot Water and Steam

Oil-Fired Automatic Water Heaters

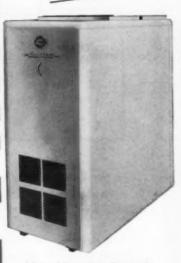
120 gal./hr. recovery

PLUS

Rotary Wall Flame Conversion Burners, Furnaces, Boilers

Hot Water and Steam

Oil and Gas Fired



A broad line of quality equipment for oil and gas firing. Get full details today.



equipment developments

(Continued)

Steel Products, Inc., Dept. AA, 890 Stanley Ave., Brooklyn 8. Dampers are available at no extra cost. Designed for quick installation, baseboard uses no bolts or screws. Brackets slide into notched grooves; front cover and end pieces, corners, and joint strips all snap into place. Double tier notches are pre-cut on back panels which mount flush to wall at floor line to accommodate carpeting or tile.

Clock Thermostat

"Tempotherm" model 365 automatic clock thermostat for heating and cooling—General Controls Co., Dept. AA, 801 Allen Ave., Glendale, Calif. Featured



are night setback and morning pickup for controlling humidity and offsetting cooling load of maximum daytime temperature by "storing" cooling capacity in summer, and to provide quick heating in mornings during heating season. Dials and switches are designed to protect walls and woodwork from finger smudge. Case is stainless steel.

Vane Damper

Variable inlet vane damper for controlling air volume and pressure of airfoil centrifugal fans—Chicago Blower Corp., Dept. AA, 9867 Pacific Ave., Franklin Park, Ill. Designed to fit into fan housing, unit serves as manual or automatic output control, reducing power consumption, the company states. Pie shaped metal vanes which are adjustable at angles from zero to 90 deg spin entering air in direction of fan blade rotation. Vanes can be adjusted when fan is operating. Units fit fans from 12 through 80¾ in. in diameter; they are available as part of company's fans or can be ordered and installed separately.

Cooling Coil, Blower Unit

Models TEU and TEH, V type and flat type evaporator coils and blower designed to be used with company's "Thrifti-Kool" 2, 3 and 5 hp air cooled condensing units—Typhoon Air Conditioning Co., Div.



Stainless Steel welding information:

how to get strong welds in thin sections

Thin Stainless Steel sections can be easily welded without flux if you use an inert gasshielded electric arc procedure. The welder in the picture is using an argon atmosphere. It shields the welding zone from slag impurities, eliminates fumes and spatter, and produces a clean, dense weld.

The process is especially suited for USS Stainless Steel grades 301, 302, 303, 305, 316, 317, 321, 347, and 410, in thicknesses from .025 to .25 inch. The tungsten electrode used is not consumed, and it will not pick up carbon. If filler metal is needed, it can be the same as the parent metal. There is little distortion, even in thin sections, when properly

If welding rod is used, it should be of the proper composition, and all the usual joints can be made easily. Either DC or AC current can be used, but direct current gives greater penetration and speed. Surfaces should be clean, and you should use a back-up bar, or a mixture of Stainless Steel flux and shellac

on the under side.

To develop the very maximum strength and corrosion resistance, the welds should be annealed—although this is not always necessary. The subject is covered fully in our comprehensive Stainless Steel "Fabrication" book. Write on your company letterhead for your copy to: United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

If you'd like, we'll have a representative call and discuss your special shop problems.

UNITED STATES STEEL CORPORATION, PITTSBURGH AMERICAN STEEL & WIRE DIVISION, CLEVELAND COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO NATIONAL TUBE DIVISION PITTSBURGH TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS UNITED STATES STEEL EXPORT COMPANY, NEW YORK



SHEETS . STRIP . PLATES . BARS . BILLETS PIPE . TUBES . WIRE . SPECIAL SECTIONS

UNITED STATES STEEL



For "Frosit Insurance" offer luxury features at practical prices!

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Tonsement attached hereto tese Company shall not all the studies for loss occurring.

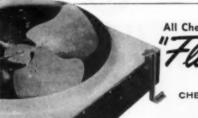
To while the hease of is increased by any means within the con-

Homes equipped with Chelsea cooling and ventilating units have terrific extra sales appeal — yet the cost is so low that installation is practical for homes in any price range. Attic fans for complete home cooling, kitchen and bathroom ventilating fans and kitchen range hoods are luxury features that can easily turn prospects into buyers. . . By planning now — while your homes are under construction — installation is so easy that costs are negligible . . Get the details from —

company's continued above the first continued above the property of the property continued and there. This continued are the continued at the continued are the continued are

Home Cooling is a

"Sales Must"!



Floating Action

CHELSEA FAN & BLOWER CO., INC. PLAINFIELD, NEW JERSEY

No. 59-28

equipment developments

(Continued)

of Hupp Corp., Dept. AA, 505 Carroll St., Brooklyn, N.Y. Model TAH air handling blower can be used with TAR condensing unit and matching TEH horizontal air flow flat type evaporator coil, which measures 30 9/16 × 9 3/4 × 24 3/16 in. TEU, V type coil is 19 9/16 × 8 × 28 3/8 in. Air handling blower model TAH with casing measures 30-7/16 × 25 3/8 × 24 3/16 in.

Manometer Line

Series 1225 manometer for use as light pressure and vacuum indicators—F. W. Dwyer M/g. Co., P.O. Box 373, Dept. AAC, Michigan City, Ind. Instruments are in 6, 12 and



18 in. sizes with straight or inverted U connections for rubber tubing at top. Double walls are clear plastic tubing. Scale, designed for good legibility and freedom from parallax, is protected by lacquer coating and is adjustable vertically for zeroing.

Flexible Shaft Machines

Two models of variable speed flexible shaft machines for polishers, sanders, etc.—Wyzenbeek and Staff, Inc., Dept. AA, 223 N. California Ave., Chicago 12. Units are 1/3 to 1½ hp; speed changes from 2000 to 7200 rpm can be made by turning hand wheel. Light and flexible shafts are designed for sequence of operations in finishing of stainless steel and other metals, according to the manufacturer.



"Quality Heating is being installed here"

 NIAGARA builds quality "year 'round air conditioning" equipment which will provide years of dependable service. Because of this quality, NIAGARA also builds profits for heating dealers.

NIAGARA furnaces are gas or oil fired and available in many capacities and models to fit practically every home heating requirement. If you want the "cream of the crop" there is no finer furnace than the NIAGARA Series 50. For economy purposes the quality-built NIAGARA Series 70 furnace "fits the bill".

Get the facts. Find out how NIAGARA offers you the opportunity to sell quality heating and build profits for yourself.

For complete information, write direct or contact your NIAGARA distributor.

NIAGARA FURNACE DIVISION

The Forest City Foundries Co. 2500 West 27th St. — Cleveland 13, Ohio



The finest gas-fired furnace line available for home heating. Equipped with the exclusive NIAGARA cast iron heat exchanger and 3-speed blower. Completely automatic. NIAGARA refrigerated unit can be combined to provide the best in "year round air con-



NIAGARA Series 70

The law-cost quality furnoce line with High Boy, Down Flow and Basement Models. Completely automatic, gas or all fired, available in a wide range of sizes.





There's no outside bag to worry about...no bag that you have to empty...with NEW SOOTMASTER. This new kind of furnace cleaner has a super-efficient disposable filter with throwaway bag inside the tank. Double filtering action guarantees cleaner cleaning. Light weight. Easy rolling. Preferred by professionals.

G.E. & PREMIER OWNERS!
Replace outside bag with
SOOTMASTER Filter Unit
THROWAWAY BAG! to this...

ELIMINATE OUTSIDE BAG MODEL FU-TA

Model UC-1A
Brand new suction motor
unit plus FU-1A disposable filter unit assures
quiet operation. Fits G.E.
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economy replacement;
Guaranteed\$54.50

Dust bags and hoses for all industrial models. Order from your jobber. Jobber inquiries invited.

Distributed in Canada by Imperial Refractories

DISPOSABLE

FILTER

YOUR

TANK

MASTER-CRAFT SUPPLY CO., INC. W. HAVERSTRAW, NEW YORK

equipment developments

(Continued)

Dehumidifier Unit

Model A09A dehumidifier for homes or plants where air needs drying—Bryant Mfg. Co., Dept. AA,



2020 Montcalm, Indianapolis, Ind. Unit delivers 150 cfm of free air; it is 17 in. high. Dryer operates on 230-v, 3 wire power supply; straight 115-v optional model is designed for residential use. Exhaust vent is reguired indoors, discharge and return ducts are needed for outside installation. Constantly revolving drum of silica gel desiccant draws moisture from the air; while one area of desiccant adsorbs moisture, another area is being heated to drive moisture out. Heat is obtained from tubular resistance heater, according to the manufacturer.

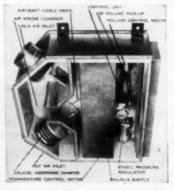
Condensing Units

Semi-Hermetic 5 and 7½ hp condensing units for residential and small commercial cooling systems—Brunner Mfg. Co., Dept. AA, 1821 Broad St., Utica 1, N.Y. The 5 hp, four cylinder units are cooled by air, water or both. Semi-sealed 7½ hp units are six cylinder, water cooled units, the company states.

High Velocity Units

Series 45 valve attenuators with 45 deg air inlet connections which permit direct connection to any type of duct layout—Connor Engineering Corp., Dept. AA, Shelter Rock Lane, Danbury, Conn. Helical neoprene dampers have rubber-to-rubber con-

tact; air pressure and velocity are throttled through soft-walled venturi section; aircraft cable drive over



nylon pulleys eliminates control lag, the company states. Thermostat-controlled motor proportions hot and cold air flow. Second motor, actuated by pressure regulator, maintains constant volume. Air volume of each valve is adjustable. Units are made for capacities of 140 to 1200 cfm in

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Power These Fuel-Thrifty Units



Mødel ORA Winter Air-Conditione



9

Medel ORU Beiler

Model ORA Hi-Boy

Nodel ORM Nodel ORM Water Heater You make useful friends out of customers when you sell time-tested TORIDHEET Rotary Wall-Flame equipment. The operation is so reliable and quiet, the fuel economy so great, that customers tell friends and neighbors—actually become part-time salesmen for you.

Proved fuel savings up to 40% and trouble-free operation (only 1 moving part) make TORID-HEET a profitable line for you

to sell—a profitable line for your customers to buy. If you're not selling TORIDHEET you're missing a bet!

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Wall-Flame Oil Burners • Gun Burners • Wall Flame Boilers • Furnaces and Water Heaters
Gun Fired Boilers and Furnaces • Gas Conversion Burners and Gas Fired Furnaces
Low-Boys • Hi-Boys • Counterflows • Comfort Cooling Equipment

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CLEVELAND

OTMINE PLANTING

Toridheet Division CLEVELAND STEEL PRODUCTS CORPORATION

16035 Brookpark Road . Cleveland 11, Ohio

Affiliated Canadian Manufacturer: Aero Tool Works Limited, Toronto, Ontario

equipment developments

(Continued

above-ceiling or under-window mod-

Conversion Unit

Model OG-56 oil-to-gas conversion units ranging from 60,000 to 150,000 Btu input—Banner Burner Co., 227 E. Indianola Ave., Dept. AA, Youngstown, O. Unit, which fits through 4



in, oil burner sleeve, features onepiece cast iron construction of venturi and flame spreader. Unit has three parts: front plate, venturi and flame spreader, and manifold.

Refrigerant Leak Finder

LIGHTWEIGHT blow torch designed to show up leaks in refrigerant fittings and joints—Kidde Mjg. Co., Inc., Dept. AA, Bloomfield, N.J. Torch is lighted and held with one hand while the other hand moves opening of rubber tube over piping; if refrigerant is present, torch will emit brilliant green flame. Torch supplies 30 min. of 3500 F flame for light soldering operations.

Malfunction Detector

"VIBRASWITCH" malfunction detector for protection against excess vibration in pumps, motors, compressors, fans and blowers—Fielden Instrument Div., Robertshaw-Fulton Controls Co., Dept. AA, 2920 N. Fourth St., Philadelphia 33. Unit automatically shuts down protected equipment

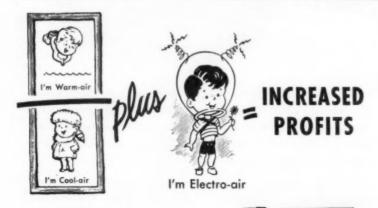
or sounds alarm when normal operating vibration is exceeded.

Unit Heaters

DIRECT FIRED unit heaters with capacities from 400,000 to 2,000,000 Btu with gas, oil or dual fuel burn-



ers—Reznor M/g. Co., Dept. AA, Mercer, Pa. Units can be installed for top, bottom or horizontal discharge and can be adapted for use in duct systems. Features include



INCREASED PROFITS are yours when you install an Electro-air electronic air cleaner with every installation of a forced-air furnace (Warm-air) or air conditioner (Cool-air).

Owners of homes, stores, and shops will be pleased with the benefits that Electro-air will give them:

- · clean, fresh air
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- reduction in cleaning costs

Electro-air "Compact Line" units are made in nine models, both horizontal and vertical air flow, with capacities from 800 to 4,800 cfm.

All parts including selenium rectifiers are guaranteed for five years.

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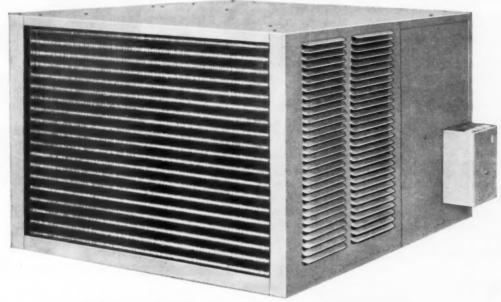
ELECTRO-AIR CLEANER COMPANY, INC.

1285 REEDSDALE STREET, PITTSBURGH 33, PA.



You know those rare days when everything checks? Air smells good. Food tastes terrific. Even the old face looks good in the mirror. Today can be that kind of day. Just do two things. Call your doctor for a thorough medical checkup for cancer. Then write out a check—a nice fat one—to the American Cancer Society, and send it to "Cancer" in care of your local Post Office.

AMERICAN CANCER SOCIETY



New Crane air conditioner offers central cooling in one package

New self-contained 2-hp and 31/2-hp units come with complete fiberglass duct systems

Now Crane puts central air conditioning within the range of the average budget with a low-cost central cooling system in one complete package.

One of the things your prospect will like most is that this new system comes all in one. Just as you see it in the picture. Compressors, condenser, blower and evaporator all in one husky steel cabinet about the size of a TV set (almost as easy to install, too).

Even more important is the fact that this new Crane air conditioner is available with its own prefabricated ductwork package. The package includes lightweight fiberglass ducts, ceiling diffusers, central grille and filter for 5-6- or 7-room installations. Which means you can install this unit in any kind of house—even one with hot water or gravity warm air heat. (With forced warm air heat, of course, the cooling unit can be tied in to your customer's present ductwork.)

Get all the important details now from your Crane Branch or Crane Wholesaler.

In plumbing, too, ask for Crane quality.

Here are the other money-makers in Crane's complete line of air conditioning:



1. Sunnyland "addon" units. 2-, 3-, 5ton sizes. "A" type coil shown.



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3. Crane Commercial Packaged Units from 3 to 40 tons water cooled—2 to 10 tons air cooled.

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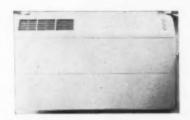
equipment developments

(Continued)

"floating" stainless steel heat exchanger and four-pass design.

Window Cooling Units

"SUPER-CRESTLINE Weathermaker" line of room cooling units designed for reduced electrical requirements— Carrier Corp., Dept. AA, 300 S. Geddes St., Syracuse 1, N.Y. Units in-



clude $\frac{3}{4}$ and 1 hp models, designed to operate on most household electrical circuits (the 1 hp unit requires single outlet circuit). Featured is "power cooling" control with two-step thermostat which slows fan and

increases moisture removal as temperature approaches preselected setting. Flush grille is also featured.

Roof Ventilator

Models 405 and 505 redesigned roof ventilators which are said to provide 40 percent more free area than their predecessors—Leigh Building Products Div., Air Control Products, Inc., Dept. AA, Coopersville, Mich. Models 405 (aluminum) and 505 (galvanized steel) have 52 sq in. net free area. Units feature one-piece base with upward sweep at collar attachment.

Transformer Units

"STANCOR" step-up and step-down transformers designed for converting 208-v cooling units to 230-v units and vice versa—Chicago Standard Transformer Corp., Dept. AA, 3501 W. Addison St., Chicago 19. Designed for 60 cycle operation, units have line cord, 250-v plug and receptacle.

Baseboard Diffuser

"SOLAIR" perimeter baseboard diffuser in 2, 3 and 5 ft lengths—II &



N Sheet Metal Fabricating Co., Inc., Dept. AA, 209 S. Main St., Deer Lodge, Mont. Designed for modernization installations as well as new homes, units can be installed in sections joined together with splice plates; existing sill plate does not have to be cut, according to the manufacturer.

Hand Operated

BOX AND PAN BRAKES

One Man Operation - Quick Adjustments - Rugged Construction



UNIVERSAL BOX AND PAN BRAKES Capacities up to 12-gauge sheet metal and bending lengths up to 10 feet.



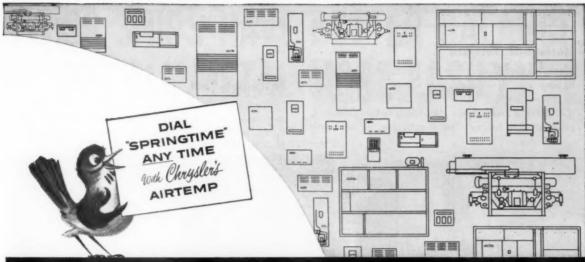


BENCH MODEL BOX AND PAN BRAKESMade in three sizes with bending lengths of 24, 30, and 36 inches up to 16-gauge sheet metal. Stand is available as extra.

Descriptive Literature on Request.

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are recognized by all home owners for quality and finest performance!

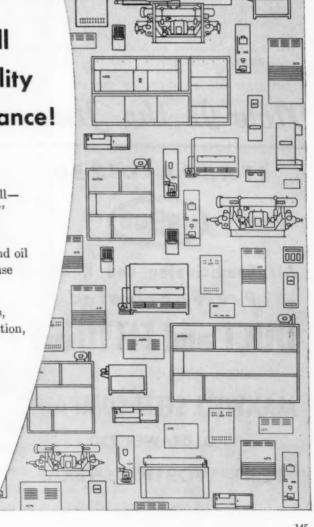
Because Airtemp furnaces have such wide consumer acceptance, they are easier to sellat greater profit. They give you the "plus" features that overcome price competition.

They provide a full line-in both gas and oil models. All may be adapted for whole-house air conditioning.

For news on Airtemp heating franchises, write Airtemp Division, Chrysler Corporation, Dept. AA-6-57, Dayton 1, Ohio.



HEATING AND AIR CONDITIONING FOR A ROOM, A HOME, A BUSINESS, AN AUTOMOBILE



Horizontal Furnace

MODEL 166/167 "DUALOCK" horizontal furnace in furnace and blower assemblies which can be changed to reverse air flow pattern—Mueller Climatrol, Dept. AA, 2005 W. Oklahoma Ave., Milwaukee. Designed primarily for basementless homes, unit is equipped



with ducts. Gasket seal between blower and furnace provides tight assembly; wedge device locks furnace and blower together. Model 166 has direct drive blower and is rated at 80,000 and 100,000 Btu input. Type 167 has belt driven blower and is in 80,000 to 140,000 Btu input. Featured are double ventilated shield to insulate top of draft diverter; welded steel casings;

metal protector enameled inside and out; cast iron slotted port burners; seam welded heat exchanger designed to accelerate scrubbing action and heat transfer.

Fastening Tool

"Shure-Set" fastening tool which uses hand hammer power to sink special fastener into concrete or 1/4 in. steel—Ramset Fastening System, Winchester-Western Div., Dept. AA, Olin Mathieson Chemical Corp., Dept. AA, 12117 Berea Rd., Cleveland 11, O. Complete kit includes hammer and metal tool box. Single section rubber hand grip is featured. "Duo-Johnsster" powder actuated fastening tool utilizes energy from fired cartridge to sink fastener into concrete, steel, etc.

Remote Cooling Unit

"Heat Chaser" combination water and air cooled remote cooling unit in cylindrical shape—Harvey-Hill, Inc., Dept. AA, 2209 Lynch St., St. Louis 18, Mo. Available in 3 and 5 ton sizes, condensing section with compressor is designed for outside installation while cooling coil is installed in furnace plenum or duct. Soaker coil (which replaces refrigeration condenser) combines advantages of air and water cooling.

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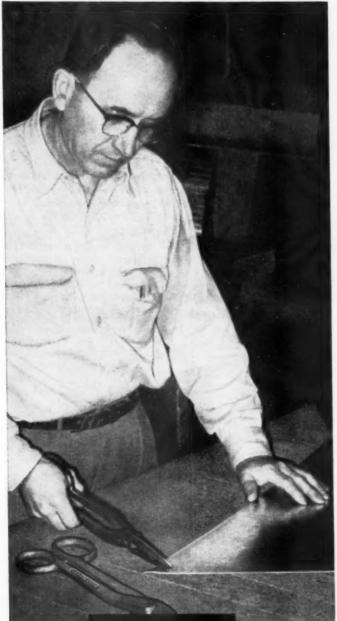
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says James LaMal, Shop Supt., Badger Sheet Metal Works, Green Bay, Wisconsin



"Here at Badger Sheet Metal Works, we've earned a reputation for doing first class sheet metal and furnace work," says James LaMal.

"But make no mistake about it, a first class reputation requires first class tools . . . and when it comes to snips, that means Wiss.

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The unusual features that Mr. LaMal praises result because Wiss snips are hand-made by metal craftsmen for metal craftsmen... actually require as many as 200 steps to manufacture. Why not benefit from this exclusive quality in your sheet metal operation? You'll soon discover—You can't miss with Wiss!

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WISS SNIPS TAKE AS MANY AS 200 STEPS TO MANUFACTURE, MANY BY HAND

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You can cover the whole waterfront of residential and commercial oil burner requirements with the Nu-Way line. Nine models bracket fuel consumptions ranging from .65 to 33.00 g.p.h. And, each model is designed to deliver high efficiency over a wide firing range. A complete selection of flange and adjustable pedestal mounts is further insurance that Nu-Way is the only name you need to know in fine oil burners. Nu-Way Corporation, Rock Island, Illinois.



Vacuum Pump

LIGHTWEIGHT VACUUM pump for installing and servicing cooling units-Armstrong Furnace Co., Dept. AA, 851 W. Third Ave., Columbus 8, O. Designed for Armstrong units, pump is built to obtain high ultimate vacuum at dependable pumping speed. Featured



are external oil fill cap for maintenance of proper o:t level; direct connection between suction line and suction cap on manifold; standard refrigeration valve connected to pump base and attached directly to suction line; built-in carrying handle; and motor overload protection. Unit weighs 31 lb; compressor is powered by 1/6 hp, 115-v motor.

Highboy Furnace

GAS- AND oil-fired highboy furnaces rated at 150,000 Btu input, for residential application-Worthington



Corp., Dept. AA, Harrison, N.J. Featured are high static blowers designed especially for installation where cooling will eventually be added.

Medium Pressure Fans

MODEL SP-7 FANS for operation against static pressures normally considered above the range of propeller type fans-Aerovent Fan Co., Inc., Dept. AA, 700

Genuine masonry Van-Packer Chimney gives high draft -- is safe even for incinerators

Your heating installation operates best when you install the Van-Packer Factory-Built Masonry Chimney. High draft, provided by Van-Packer's 3" vermiculite-concrete insulating wall, assures this peak furnace efficiency.

Van-Packer's permanent masonry construction enables it to vent even an incinerator safely and efficiently. The \$\frac{5}{8}"\$ fire clay tile liner withstands over 2100°F., more than enough to resist the heat shocks and high flue temperatures developed by incinerators.

Why not profit on the *entire* heating system by installing the Van-Packer Chimney with your furnace? And because Van-Packer's high draft increases furnace operating efficiency, you save on needless furnace service call-backs.

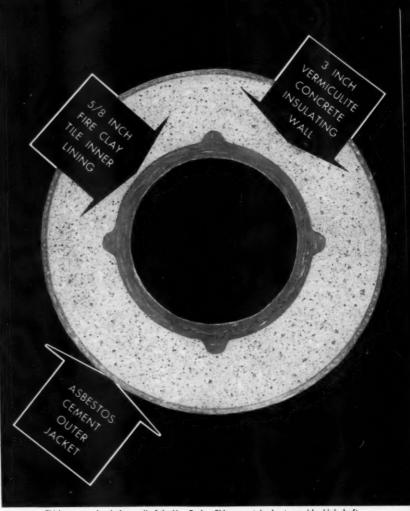
What's more, you'll be giving your customers the finest prefabricated chimney on the market today—the safe, permanent, attractive Van-Packer Factory-Built Masonry Chimney.

No job delays, immediate delivery from your local heating jobber. See "Chimneys—Prefabricated" in Yellow Pages, or write Van-Packer Company for Bulletin RS-1-11.

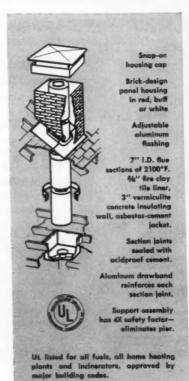


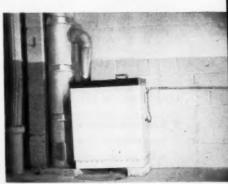
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Phone: 5-2621

Also Manufacturers of Van-Packer Fire Clay Tile Gas Vent



Thick masonry insulating wall of the Van-Packer Chimney retains heat, provides high draft.





Van-Packer Chimney incinerator installationcan be suspended or pier supported.

Van-Packer Chimneys come completely cartened for easy handling.



NOW there are 14

. . a size and type Humidifier for every furnace installation.

EVERY MODEL TESTED AND PROVED



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- No extra holes to cut
- No tricky mounting



EVERY MODEL WITH NEW SENSITIVE THERMO-STAT CONTROL TO ASSURE BALANCED HUMIDITY

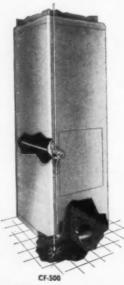
LOW COST

 Designed especially for basementless houses

with perimeter heating.

COUNTERFLOW STYLE

- Complete assemblies for furnaces with concrete floor plenums or with crawl space plenums.
- Installs in minute on exterior of furnace casing.
 All parts furnished.



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AUTOMATIC HUMIDIFIER CO, Cedar Falls, Iowa.

equipment developments

(Continued)

E. Ash St., Piqua 2, O. Designed for medium pressure range up to 4 in. static pressure, units move larger volumes of air at lower speeds and less horse-power. Airfoil propellers have seven blades. Units are available in direct connected, direct driven duct, belt driven duct, "bi-flow" duct and extended shaft types in a number of sizes ranging from 14 to 60 in. diameters.

Remote Cooling Units

"STANDARD" LINE of remote air cooled cooling units in 13/4, 3 and 5 hp models—Perfection Industries



Div., Hupp Corp., Dept. AA, 1135 Ivanhoe Rd., Cleveland 10, O. Designed as lower priced companion model to "Deluxe" line, unit has U shaped, flat or horizontal cooling coil. Air handling unit in horizontal or vertical arrangement is available from the manufacturer.

Multiple Operation Time Switch

TWENTY-FOUR HOUR multiple operation time switch for automatic control of intermittently-operated equipment—Zenith Electric Co., Dept. AAC, 152 W. Walton St., Chicago 10. Switch handles up to 48 "on" and 48 "off" operations in one day. Control dial scaled in 15 min. graduations is used to set up daily operating schedule. Calendar cutout device to make switch selective for all seven days of the week is available. Switch is powered by a 60 cycle a-c motor, according to the manufacturer.

Lowboy Furnace

"Whisper Quiet" gas- or oil-fired lowboy furnace with built-in leveling device—Rybolt Heater Co., Dept. AA, 615 Miller St., Ashland, O. Featured are dust-tight cabinet, pressure tested heavy gage wraparound heat exchanger, built-in access light, polished aluminum trim, optional electrostatic air filter, fully automatic operation.



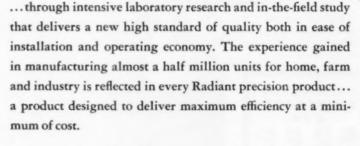








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The most advanced techniques in the field are incorporated into every Radiant product. This never ending search for the latest and newest ideas for customer satisfaction is your assurance that the developments of tomorrow are here today in a Radiant engineered product.

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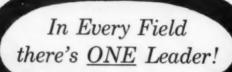








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in Furnace Cleaning the Leader is the <u>PULLMAN</u> <u>NEVER-CLOG VAC!</u>

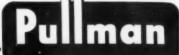
• The Pullman gets you in and out of the cellar fast because it's guaranteed never to clog under any conditions.

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Clog Vac, so I can make more calls . . . more sales . . . more profits per day.

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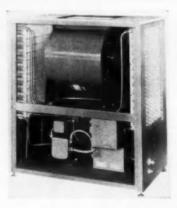
_____ ST

equipment developments

(Continued)

Air, Water Cooled Units

AIR COOLED AND water cooled summer air conditioners in 2, 3, 5, 7½ and 10 hp models for residential and commercial application—U.S. Air Conditioning Corp., Dept. AA, 7900 Tabor Rd., Philadelphia. Water cooled units from 3 to 10 hp and air cooled units from



2 to 7½ hp feature rotatable blower which can be changed on job from standard vertical discharge to horizontal discharge. Water cooled units have hermetic and semi-hermetic compressors. Compressor section is insulated and isolated. Air discharge area is insulated with glass fiber. Fan housings have welded seam construction and wheels are balanced. Piping connections are above insulated condensate pan. Units can be converted to air cooling by use of standard cutoff valve. Air cooled units have two condenser coils and two air inlets. Other components are leveling adjustment feet, complete control kit and an evaporator sequencing panel. Optional equipment is available for both models. Feature is condensed arrangement which results in smaller size.

Colored Furnaces

FURNACE LINE in variety of colors, in keeping with modern trend for families to spend more time in the basement—Front Rank Mfg. Co., Dept. AA, 2500 Ohio Ave., St. Louis 4, Mo. Designed to match decor of recreation room and utility area, furnaces are in red, yellow, green, pink, beige, blue and white, according to the manufacturer.

Ceiling Diffuser

Model MO-MJ ceiling air diffuser for modular installations with all types of tile ceilings—Air-Factors, Inc., Dept. AA, 1624 S. Raymond Ave., Monrovia, Calif. Multi-orifice, multi-jet units are made in square and rectangular outlets that match ceiling tile construction and span any T bar suspended structure.



This handy guide shows you, instantly, the filter refills which may be used, interchangeably, in all leading filter units.

Filtration For Every Known Fluid

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PRODUCTS, INC.

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With the addition of three new sizes, the famous PurOlator line of Micronic® filter refills (including gaskets) will now fit 98% of all oil burner installations.

In addition to supplying most requests from a minimum stock of four sizes, you can give your customers the five outstanding benefits of PurOlator Micronic filtration—no matter what filter is installed on their job.

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- Will not shrink, distort, stretch, flake or deteriorate.
- A guaranteed filtering capacity of over 100 gallons per hour U.L. approved.

Dept. OB5-103 Rahway, New	r Produc	ts Co., Inc.
Please send me Element Cross-Re		r Oil Burner Filte
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Hermetically sealed Little Giant Recirculating Pump for trouble-free self-lubricating operation.
 Positive displacement switch with float control, double pole switch for complete circuit break plus a three-conductor cord available.
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 Little Giant Pump, hermetically sealed in oil, self lubricating.

Die-Cast aluminum case. Small and compact. Economical to operate. Available for 110 volt 60 cycle or 220 volt single phase current. Can be operated completely submerged.



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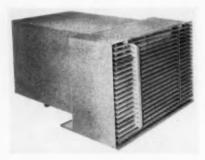
equipment developments

(Continued)

One, two, three and four way balanced air distribution systems are available with the outlet, the company states.

Packaged Cooling Unit

MODEL 1103 AIR cooled cooling unit with 3 hp rating, designed for 5 to 6 room houses—Airtemp Div.,



Chrysler Corp., Dept. AA, 1600 Webster St., Dayton 1, O. Features are automatic thermostat with on-off switch for cooling circuit and switch for independent blower operation; glass fiber duct work kit; seven ceiling diffusers; two return air grilles and outside grille. Unit measures $27 \ 11/16 \times 45 \times 53 \ 7/8$ in.

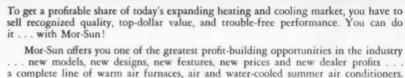
Vacuum Cleaner

"Turbo-Vac" vacuum cleaner which may be used either as complete unit for ordinary light cleaning operations or in combination arrangement for heavy duty operations—Kent Co., Inc., Dept. AA, 710 Canal St., Rome, N.Y. Units are in four models, with tank capacities from 2/3 bu or 5 gal to 1 2/3 bu (10 gal). "Drum-Seal" unit can be combined with head for large operations, including furnace cleaning, removing dirt from ducts, cleaning filters and other components of heating, cooling and ventilation systems. Removable head fits into the "Drum-Seal" unit and is used in conjunction with a metal container which determines capacity.

Summer Air Conditioners

LINE OF COOLING units rated at 21,000 to 60,000 Btu in three models—Delco Appliance Div., Dept. AA, General Motors Corp., 391 Lyell Ave., Rochester 6, N.Y. Units have air cooled condensers, hermetically sealed electric compressors rated at 230-v, 60 cycle, single and 3 phase. Two hp model is rated at 21,000 Btu; 3 hp model, 33,800 Btu; 5 hp model, 60,000 Btu. Space required for cooling coils varies from 14 \times 18½ \times 22 in. to 23 \times 28½ \times 22 in. for vertical models, and from 15¾ \times 12 \times 24½ to 18¾ \times 12 \times 37½ in. in horizontal units.





First, see what you get from Mor-Sun — see what it costs — and then see how much more it puts in your pocket. Mor-Sun advanced design and engineering, plus the latest mass production methods, backed by hard-hitting merchandising, have teamed up to give you top-quality equipment, on-the-line competitive prices, faster turnover and bigger, much bigger profits.

YEAR-ROUND SALES WITH MOR-SUN YEAR-ROUND AIR CONDITIONING

. . . a perfect example of the "MORE" you get with MOR-SUN

HEATING-COOLING
COMBINATIONS

. . . easy to install
. . . in a minimum of floor area

. . . finished in two-tone green, polished copper trim
. . . backed by a written guarantee of dependability
. . . priced for profits to you

UPFLOW, REVERSEFLOW & LO-BOY FURNACES

. . . completely wired and assembled
. . . gas or oil, in a complete range of sizes
. . new noise-free blower and washable air filter
. . . priced for profits to you

AIR & WATER-COOLED
AIR CONDITIONERS

. . . complete residential and light commercial line
. . . full rated cooling capacities
. . . precharged system on air-cooled models
. . . priced for profits to you

There's a Mor-Sun Furnace and Air Conditioner for every home heating and cooling requirement...
the right size...the right price...for new construction and modernization.

you get so much more with

MOR-SUN

HEATING AND AIR CONDITIONING



Mor-Sun Division, MORRISON STEEL PRODUCTS, INC., P.O. Box 3003, 609 Amherst St., Buffalo 7, N.Y.

In Canada, manufactured by Mor-Sun Limited, 62 Laurel St. East, Waterloo, Ontario.





You can't beat this pair for combination heating and cooling perimeter systems...



Try this combination in just one home with a basement and you'll be convinced of performance and economy far superior to any warm air system.

- Hot and cold zones are positively eliminated.
- Operates efficiently at all times, regardless of whether draperies or curtains are in open or closed position.

STYLE P-28 FLOOR DIFFUSER

Available in six sizes from 2½ x 10 to 4 x 14.

STYLE A-O5 FLUSH RETURN AIR GRILLE
Available in sixty one standard
sixes.

We make a complete line of registers, diffusers and grilles for all types of heating and air conditioning installations. Write for your copy of our catalog.





The A & A REGISTER COMPANY

8327 CLINTON ROAD . CLEVELAND 9, OHIO . ATlantic 1-6166

6 reasons why Residential

Heating & Air Conditioning Dealers say...

'Fraser-Johnston is the best package in the industry."



Updraft stream lined heat exchanger No internal baffles, no hot spots, no pockets for condensation. Die-formed, completely welded construction



Matching, inter-lock coil evaporater for cooling.



Casing, feil and fiberglass lined for cool, quiet efficiency. Assembled and wired at factory, all service from front.



LARGE 13-inch diameter wheels on belted drive models for large air handling capacity, quiet operation. Blower motor suspended by rubber.



non-clogging burners Long-life, non-clogging purners, with built-in aspiration, for all Long-life, gases, including L.P.G.

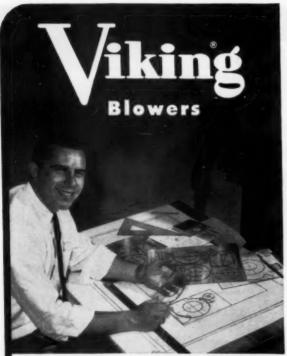


Model A-17 remote air cooled condenser - large hi-capacity condenser for quiet operation.

Most Fraser-Johnston Furnaces are high static approved by A.G.A. for .6 w.c. Basement, upflow, counterflow and horizontal models. For complete engineering data, price lists, and available territories, write:

OVER A QUARTER CENTURY LEADERSHIP

1900 - 17TH STREET + SAN FRANCISCO, CALIFORNIA



Viking's new pressure sensitive design kit cuts my blower fitting problems in half"

New Viking Blower Design Kit

... makes it easy to plan how Viking's Interchangeable "B" Blower will fit into units you're designing without using a pencil! Adhesive-backed transparent scale drawings permit you to combine feet, different size motors and blower housing in the right combination and proper position for your reproduction machine in minutes.



New Viking "B" Interchangeable Blower



- First cushion-bearing with built-in journal for longer life.
- First factory-packed bearing which is oilable.
- First all-welded non-flexing high-speed wheels.
- First truly interchangeable blowers to reduce your test time and costs.

Write on your letterhead for your "Blower Design Kit"

VIKING AIR PRODUCTS

5601 Walworth Ave., Cleveland 2, Ohio

new literature . . .

Diffusers and Registers

CATALOG 57 (12 pages, illustrated) describes the features of floor and baseboard diffusers for perimeter systems; wall and baseboard registers for air conditioning applications; and registers, intakes and return air faces for gravity installations. According to the company, the new "P-68" baseboard diffuser, only 18 in. in length, has 28 sq ft. of free air space—The A & A Register Co., Dept AA, 8327 Clinton Rd., Cleveland 9.

Standards for Cooling Units

ARI STANDARD 210-57, "Unitary Air Conditioning Equipment," supersedes Standard 2-10 entitled "Self-Contained Air Conditioners" and Standard 620-56, "Published Ratings for Residential Air Conditioners." The purpose of this standard is to establish minimum industry standards of performance of unitary air conditioners and to provide means for establishing reliable ratings. The standard is priced at 35 cents—Air-Conditioning and Refrigeration Institute, Dept. AA, 1346 Connecticut Ave., N. W., Washington, D. C.

Portable Nibbler and Shears

DATA ON No. 16 sheet metal nibbler, operating on a punch and die principle, is contained in a four page illustrated bulletin. The tool is designed for continuous production cutting in all types of sheet metal up to 18 gage thickness or intermittent heavy-duty cutting in sheet metal up to 16 gage thickness. Also described are No. 16 electric shear for cutting metal up to 16 gage and No. 12 shear for thicknesses up to 12 gage—Black & Decker Mfg. Co., Dept. AA, Towson 4, Md.

Gas Vent Pipe and Fittings

Dealer Service Bulletins, scheduled for publication about four times a year, discuss new "Metalbestos" products, product modifications, improved methods and procedures, etc. A standard feature deals with actual field installations and shows the use of the company's gas vent tables in solving venting installation problems. A listing of literature and services available to dealers is included—William Wallace Co., Dept. A.A., Belmont, Calif.

Gas Fired Furnace

BULLETIN 511-A covers gas-fired "Lo-Hi-Boy" furnace which can be adapted to year 'round air conditioning by the addition of an evaporator unit installed above the furnace and a condensing unit installed outside (Continued)

the home. A cutaway illustration shows features of the furnace including "Uniweld" cabinet, "Acoustifoil" cabinet liner, steel heat exchanger and double width blower—Armstrong Furnace Co., Dept. AA, 851 W. Third Ave., Columbus 8, O.

Chimney Construction

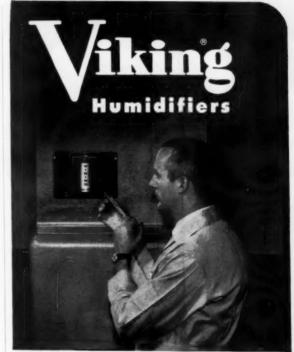
RECOMMENDATIONS for safe chimney construction and specifications for clay flue lining are presented in an illustrated six page brochure. Detailed illustrations show components and recommended construction for an interior independent chimney, method of flashing roof surface, and protection of wood near chimneys. Also included is a table of dimensions for round and rectangular clay flue lining and flue rings—Clay Flue Lining Institute, Dept. AA, 161 Ash St., Akron 8. O.

Gas Heating Equipment

Gas-fired commercial heating equipment is described in catalog GN-57 (18 pages). Equipment shown includes suspended gas unit heaters (both fan and blower types) in capacities from 25,000 to 300,000 Btuh; two series of duct furnaces for system capacities from 50,000 to several million Btuh; and "PAC" horizontal furnaces in sizes from 50,000 to 125,000 Btuh. In addition to specifications, construction details and dimensional drawings, the catalog includes a variety of installation information and application ideas—Reznor Mfg. Co., Dept. AA, Mercer, Pa.

Proposed Heating-Cooling Code

"A PROPOSED CODE for Heat Producing Devices, Air Conditioning, Ventilating, Blower & Exhaust Systems, Mechanical Refrigeration" was prepared under the sponsorship of three associations: The Kalamazoo Sheet Metal, Heating and Air Conditioning Contractors' Association: The Warm Air Heating, Air Conditioning and Sheet Metal Contractors' Association of Battle Creek, Mich.; and The Greater Muskegon Sheet Metal, Heating and Air Conditioning Contractors' Association. Authored by Glen W. Rynbrand, a heating and air conditioning dealer, and A. Fred Madaus, mechanical equipment inspector for the city of Kalamazoo, the proposed code suggests provisions governing the sale, location, design, materials, construction, installation, alteration and use of heating, cooling and ventilating systems. Subjects covered include license and permit requirements, selection and duties of a mechanical equipment approval board, provisions for inspection, fees, and general installation requirements. Discussed are requirements for gas, oil and coal fired forced air and gravity heating systems; electric heat-



"The Viking '5600' Humidifier installs in 20 minutes ...eliminates nuisance calls"

- Guaranteed Leakproof Glass Pan . . . won't corrode, rust, pit or leak.
- Thirst-Tee Evaporator Plates . . . resist "caking" to insure maximum capillary action.
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- Polyethylene Tubing . . . 10 feet included with each Humidifier. No tools needed . . . it fastens watertight by hand.



Get the Complete
Profit-Packed Story
From Your
Viking
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VIKING AIR PRODUCTS
5601 Walworth Ave., Cleveland 2, Ohio



HEATING-COOLING UNITS to double your sales volume



Gas Input— 78,000—650,000 BTU

Oil Output-72,000-525,000 BTU

New Patten heating units are now available in 68 types and sizes ... all the ultimate in design and engineering efficiency... proved by 56 years of heating experience. Oil burners UL approved; Gas burners approved by AGA Laboratories. Each unit carries the famous Patten 20-year guarantee.

Cooling capacities from two to forty tons

There's amazing versatility in the PATTEN cooling line! 1957 air cooled models in self contained units, remote coil or remote condenser types. Free-standing space coolers for commercial and industrial installations. Suspended air handlers available, too.

. . . write today for complete details on these new, low-cost combination units

The Quality Line at Competitive Prices



ing; cooling systems; heat pumps; and ventilation, exhaust and blower systems. Also covered are requirements for gas and oil conversions; liquid gas equipment; oil tanks, oil piping and fittings; fuel oils; stokers; chimneys and flues; incinerators; and controls for gas, oil and coal fired equipment. Copies are priced at \$5—Glen W. Rynbrand. Glen W. Rynbrand Co., 2107 Schippers Lane, Kalamazoo, Mich.

Squaring Shears

Squaring shears and bending rolls are illustrated and described in catalog No. SR-121 (40 pages). Illustrations include photographs of complete units as well as parts such as back gage, counter balanced knife-bar, holddown, and cutting edge blades. One section covers the shearing of plastics and explains how the company's shears can be adapted to this application. Standard and optional features of all steel bending rolls are described and specifications are given for 14 models—Wysong & Miles Co., Dept. AA, 625 Fulton St., Greensboro, N. C.

Gas Regulators

FORTY PAGE CATALOG covers pressure regulators for industrial compressed gases. Entitled "Gas Regulators," the catalog deals with various types of cylinder, manifold and pipeline regulators, both single and two stage. Flow and pressure charts in graph form give data on the performance of the regulators. Ask for catalog No. 806—Air Reduction Sales Co., Div. of Air Reduction Co., Inc., Dept. AA, 150 E. 42nd St., New York 17.

Stainless Steel Fastenings

STAINLESS STEEL FASTENINGS including screws, nuts, washers, hinges, etc. are listed in Catalog 56-A (24 pages). Included are corrosion resistance tables; ordering information; standard specifications for various types of stainless steel; a table of decimal equivalents; and an explanation of the differences between thread types—Star Stainless Screw Co., Dept. AA, 655 Union Blvd., Paterson 2, N. J.

Centrifugal Dust Collectors

ILLUSTRATED FOLDER presents data on Series C centrifugal dust collectors. Included are specifications for 41 sizes covering a wide range of industrial applications. Also included are dimensional drawings, selection data, and photographs of equipment used for plastic finishing, woodworking and plant refuse shredding applications—The Kirk & Blum Mfg. Co., Dept. AA, 3180 Forrer St., Cincinnati 9.

(Continued)

Non-Metallic Duct

ILLUSTRATED EIGHT PAGE BROCHURE describes "Ceramiduct" vitrified fire clay duct for perimeter warm air heating systems. Included are detailed specifications, with typical installation plans and sectional drawings of the duct system; design information, including tables of floor heat loss factor, required duct sizes, and minimum register free area necessary for feeder lengths up to 10, 20 and 30 ft; and instructions for laying and jointing the duct with "Cerami-Tape" polyvinyl chloride tape—Straitsville Brick Co., Dept. AA. P.O. Box 381, New Straitsville, O.

Corrosion Resistant Exhaust Systems

Twelve page brochure on corrosion resistant ventilating and exhaust systems features a section covering polyethylene and non-plasticized polyvinyl chloride centrifugal fans. Included in the fan section are detailed specifications for various models, performance data, and illustrations showing various positions and arrangements designed to meet specific operating conditions. Data throughout the booklet is arranged in chart form for ease of reference—American Agile Corp., Dept. AA, P. O. Box 168, Bedford, O.

Utility Blowers

TWENTY-EIGHT PAGE ILLUSTRATED CATALOG (bulletin 3414) describes the features of "HS" utility blower sets. Selection factors, such as space volume, quantity of fresh air required, altitude and temperature correction, outlet velocity, duct size, static pressure and tip speed are discussed. Tables give outlet and inlet specifications, wheel peripheral velocity, blower speed, motor hp and net weight, as well as cfm and outlet velocity for blower speeds at 13 different static pressures within the range of ½ to 2½ in.—American Blower Corp., Dept. AA, Detroit 32.

Humidifiers

BULLETIN No. 92 contains information on portable model 654 humidifier for home or office use. Unit is 18 in. wide, 934 in. high and 11 in. deep. According to the company it maintains pre-selected level of humidity for less than 3 cents a day. Also illustrated and described is utility model 500, 101½ in. in dia. and 111½ in. high—The Herrmidifier Co., Dept. AA, Neffsville, Pa.

Sheet Metal Working Machinery

BOOKLET 203 (pocket size, 40 pages) summarizes data on power operated machines for plate and sheet metal

NOW! A NEW CONCEPT IN SOLDERING IRONS

the NEW

Insto-gas

INTERNALLY FIRED TORCH with AIR RING heat control



For the first time • A torch that meets all the requirements of the sheet metal trade!

Easy Finger Tip Adjustment • Gives the right soldering temperature for each job.

Concentrated heat • Enables light coppers to do heavy continuous work.

Melts solder • 90 seconds after lighting.

Continuous heat . Available all day.

Saves time • No stopping to change irons or replenish fuel.

Saves money • Operates up to 200 hours on a standard Insto-Gas Cylinder.

Highly Portable • Connects to cylinder with any length Insto-Gas hose.

Safe • No charcoal or gasoline fire hazards.

Two Models • No. 10-S-2 (2 lb. per pr. coppers) and No. 20-S-5 (5 lb. per pr. coppers)

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SOLDERING IRON HEATER

Clean, instant, easily controlled heat for conventional type irons is obtained with Insto-Gas No. 1500 Soldering Iron Heater. Keeps points out of flame and reduces need for tinning. Fits either cylinder or bench type Insto-Gas furnaces.

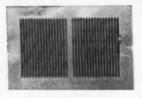
Use the complete Insto-Gas line — Torches — Furnaces — Cylinders. Available at better Industrial and Plumbing and Heating Wholesalers everywhere or mail coupon today.

INSTO-GAS CORPORATION, DETROIT 7, MICH.

.

Please send information on Soldering Iron Torches and Heaters.

the new 1957 KRUEGER DESIGN-AIR LINE



#300 - MULTI-LOUVER SIDEWALL REGISTER

GIVES YOU GRILLES BIGGER PROFITS

Successful dealers everywhere are using our products now. The new Krueger Design-Air Line is a complete, high-quality line, and it's the biggest profit line on the market today . . . because . . . it's priced right to give you bigger profits.

Write or wire for name and address of your nearest Krueger jobber and our new 36 page catalog.



#200 ROUND CEILING DIFFUSER



6" to 14" SIZES BUTTERFLY DAMPER &

KRUEGER

Air Conditioning Corp.

19 E. RILLITO · TUCSON, ARIZONA

"Design-Air" is a complete line of Grilles and Diffusers for the Residential Field plus Double-Deflection Registers and Diffusers for the Commercial and Air Conditioning Fields.



#880 O. B. D. 4-WAY DEFLECTION WITH OPP. BLADE

work. Basic specification charts, tabulated for easy reading, provide quick reference to all principal models. For complete information on individual machines or lines, references are made to specific company bulletins—Niagara Machine & Tool Works, Dept. AA, 683 Northland Ave., Buffalo 11.

Air Cooled Cooling Units

Specification sheets cover central cooling units available in 2, 3 and 5 hp models. Illustrations include photographs of complete units as well as diagrams showing typical applications. Line drawings give dimensional information — Whirlpool Corp., Dept. AA, St. Joseph, Mich.

Filter Driers for Cooling Systems

Molecular sieve filter driers for cooling systems are described in illustrated bulletin FD-157. According to the company, the driers, though small in size, operate at high efficiency due to the use of molecular sieves as the desiccant. Tables give tonnage capacities, body diameters, body lengths, flare sizes, sweat sizes and weights. Charts summarize the results of tests of the drying of refrigerants with molecular sieve as compared with other desiccants—Tube Manifold Corp., Dept. AA, 415 Bryant St., North Tonawanda, N. Y.

Gas Vented Recessed Heaters

CIRCULAR describes single and dual gas vented recessed heaters. Single models are available in 25,000 and 35,000 Btuh capacities; dual model is rated at 50,000 Btuh. A keyed drawing illustrates construction features—Peerless Mfg. Corp., Subsidiary of Dover Corp., Dept. AA, 14th & Ormsby, Louisville 10, Ky.

Cooling Towers

Centrifugal Fan cooling towers—Type WB standard and Type KB take-apart units—are described in bulletin CF-600. A cutaway drawing illustrates parts including wetted deck surface, fans, motor, housing and drive. Tables give sump capacities in gallons, operating and dimensional data, space requirements and weights per section—Halstead & Mitchell, Dept. AA, 704 Bessemer Bldg., Pittsburgh 22.

Selling Year 'Round Systems

SALES PRESENTATION MANUAL for heating and cooling dealers outlines the sales story for year 'round air conditioning. Space is included for individual dealers' shop photographs, job layouts, snapshots of past in-

(Continued)

stallations, etc. Bound in a padded leather three ring binder, the manual is priced at \$3.50—Day & Night Mfg. Co., Dept. AA, 700 Royal Oaks Dr., Monrovia, Calif.

Refrigeration Valves

Condensed refrigeration valve catalog (16 pages) illustrates and describes standard and special type valves, filters and driers. Capacity ratings are included. Ask for Form W-4-S, Section M—Controls Co. of America, Dept. AA, 2450 N. 32nd St., Milwaukee 45, Wis.

Summer Air Conditioning

FOLDER describes and illustrates summer air conditioning equipment adaptable for installation with new or existing furnaces. The units are designed for adaptation to basement, highboy, counterflow and horizontal furnaces—Thermo-Products, Inc., Dept. AA, North Judson, Ind.

Gas Venting

CATALOG OF VENT PIPE and fittings for gas burning equipment gives data on double wall, air insulated vent pipe in both 4 in. oval and in all standard sizes of round pipe from 3 to 12 in. in diameter. Features listed include ease of assembly and disassembly, low outer wall temperature, and tight joints without rough edges. Included is a chart designed to facilitate selection of vent pipe for various types of installations—Dura-Vent Corp., Dept. AA, 2525 El Camino Real, Redwood City, Calif.

Radial Drill Presses

RADIAL DRILL PRESSES designed to permit moving of the drill head in and out over the work area are described in a four page illustrated bulletin. Features listed include wide drilling range, head tilting 45 degright or left, jack shaft assembly providing wide multiple speed range, and calibrated depth indicator—Walker-Turner Div., Rockwell Mfg. Co., Dept. AA, 400 N. Lexington Ave., Pittsburgh 8.

Temperature Controls

AUTOMATIC CONTROLS for heating and air conditioning are covered in Catalog R-1500 (40 pages). New controls illustrated are "Fashion" thermostats, "Push Button" heating-cooling thermostats, farm controls, gas controls, and a shut-off automatic pilot. Included are descriptions of the company's exchange plan and the services offered by its exchange agencies—White-Rodgers Co., Dept. AA, 1209 Cass Ave., St. Louis 6.



COILED ELGEN ALL-TITE VANE RUNNERS MEANS . . .

- Less Waste! Waste pieces due to short ends are a thing
 of the past. Vane runner metal is coiled in 100 foot lengths,
 you just pull out the exact footage needed.
- Easier Storage! Each coil weighs approximately 50 lbs. and is packed in a box 28" x 28" x 5". Box fits easily under bench or against wall.
- Easier Handling! No loose pieces lying around to get in the way or collect dirt.
- Unrolls absolutely flat! Vane runner metal emerges from the box at bench height . . . absolutely flat . . . ready for use.



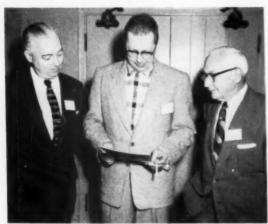
ELGEN PRODUCTS ARE SOLD THROUGH LEADING JOBBERS EVERYWHERE.

Write today for free catalog and "spec" sheet!

ELGEN MANUFACTURING CORP.
41-34 39th Street, Long Island City 4, N. Y.



we hear that . . .



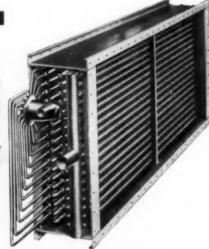
OFFICERS of Dowagiac Steel Furnace Co., Graham Woodhouse (left) and Arthur Wick (right), go over dealer merchandising program with Richard H. Leach, Youngstown, O. dealer

▶ THE DOWAGIAC STEEL FURNACE Co. recently held a two-day school for dealers from Michigan, Wisconsin, Illinois, Indiana and Ohio. Purpose of the school was to acquaint the dealers with new units added to the firm's heating and cooling line. Frank Parker, sales manager, explained the features of the new equipment and conducted a question and answer program following his talk. Other speakers included Glen Speidel, accountant, who spoke on dealer helps in accounting methods, and Arthur Wick, secretary-treasurer of the Dowagiac firm, who discussed advertising, selling and development of prospects.

- ▶ WILLIAM STEINEN MFG. Co., which is celebrating its 50th anniversary this year, is marking the occasion with the publication of an anniversary booklet presenting a "report of progress." Steps in the firm's development over the past 50 years are shown in a series of photographs of plant locations beginning with the factory occupied in April of 1907 and ending with an architect's drawing of future facilities now in the planning stages.
- ▶ THE MILWAUKEE GAS SPECIALTY Co. has announced the change of its corporate name to Baso, Inc. The name was adopted from the company's trademark. The firm builds controls for gas burning appliances.
- ADMINISTRATIVE AND SALES ACTIVITIES of Holly Mfg. Co., a division of The Siegler Corp., and General Water Heater Corp., a wholly owned subsidiary of Siegler, have been combined into a new division to

ASK THE AEROFIN MAN





For the Practical Answer to Your Heat-Exchange Problem ...

AEROFIN CORPORATION

101 Greenway Ave., Syracuse 3, N. Y.

There is a competent Aerofin heat-transfer engineer near you, qualified by intensive training and long experience to find the *right* answer to your own heat-exchange problem.

This specialized knowledge is there, ready for you to use to your greatest advantage. Ask the Aerofin man — be sure of low installation, operating and maintenance costs.

Aerofin is sold only by manufacturers of nationally advertised fan system apparatus. List on request.

(Continued)

be known as the Holly-General Co. Manufacturing operations will continue at their present locations. Sales in the southwestern states will be handled by Southwest Holly-General, a division of the Superaire Corp. Individual trade names and marketing policies will be continued.

- ▶ G. W. MALLATRATT was elected a director of Rheem Mfg. Co. at its recent annual meeting. Shareholders returned the entire management slate which included A. Lightfoot Walker, who was elected president and chief executive officer last September, succeeding R. S. Rheem, who became chairman of the board.
- ▶ WOLVERINE TUBE DIV. of Calumet & Hecla, Inc. has begun construction of a new administrative office in Allen Park, a Detroit suburb. When the new buildings are completed in 1958, 150 headquarters and general sales office employees will move from two offices in downtown Detroit to the new facilities.
- THOR POWER TOOL Co. has moved its Houston, Tex. office to new and larger quarters at 5503 Lawndale Ave.
- ▶ J. R. Lally, J. S. Leonard and J. G. McNeely were recently elected vice presidents of Copper Range Co.'s C. G. Hussey & Co. Div. Other officers elected are T. P. Lawrence, treasurer, and R. A. Daily, secretary.
- ▶ A NEW MACHINE SYSTEM processing blower wheels for a wide range of cooling and heating products is now in operation at the Airtemp Div., Chrysler Corp. According to R. J. Schumann, vice president of manufacturing, the equipment fabricates a blower wheel at an average rate of one every 35 seconds.
- ROBERTSHAW-FULTON CONTROLS Co. has begun construction of a \$250,000 western research center. The new center will carry on basic and applied research in the field of automatic controls for air conditioning and residential heating.
- ▶ Joseph T. Ryerson & Son, Inc. is holding a series of dinner parties in various cities to honor those employees who have completed 25 or more years of service with the company. Each newcomer to the 25 year group receives a gold pin and watch.
- ▶ NEELE E. STEARNS, president of Crane Co. since January 1, was elected to the firm's board of directors at the company's recent annual meeting of shareholders. The election fills the vacancy on the board



left by the death last December of David Levinger. Mr. Stearns formerly was vice president of planning and development at Inland Steel Co. He had been associated with that firm for 16 years. All other board members were reelected at the annual meeting. They are: L. N. Blugerman, vice president, Crane Co.; L. H. T. Clegg, president, Crane, Ltd. (Canada); F. F. Elliott, chairman of the board, Crane Co.; Mark W. Lowell, vice president, Continental Illinois National Bank and Trust Co. of Chicago; Edward H. McDermott, partner, McDermott, Will & Emery; William L. McKnight, chairman of the board, Minnesota Mining & Mfg. Co.; Peter V. Moulder, president, International Harvester Co.; S. M. Roberts, president, C. A. Roberts Co.; Anthony von Wening, chairman of the board, Froedtert Corp.; and R. Arthur Williams, president, Standard Railway Equipment Mfg. Co.

- ▶ CONDENSATION ENGINEERING CORP., 3511 W. Potomac, Chicago 51 has been appointed a distributor of Dura-Vent gas flues. Territory to be covered is the greater Chicago area and surrounding counties.
- ALUMINUM Co. OF AMERICA plans the construction of model homes featuring the use of aluminum

for roofs, walls and interior trim which will be on display in selected locations throughout the country this year. Colored aluminum curtain wall panels measuring 8×12 ft will be used for solid wall areas.

- ▶ Walther H. Feldmann has been elected president of Worthington Corp., succeeding Edwin J. Schwanhausser, who becomes vice chairman.
- ▶ More than 300 attended a Minneapolis meeting sponsored by the Cronstrom Co., and Lennox Industries. Mr. John Norris, president of Lennox, gave the feature address. He emphasized the importance of setting up a heating installation for the addition of cooling by properly sizing the ducts and properly locating registers. He also mentioned the industry's efforts to get the home owner to deal only with a qualified dealer.

Bruce Cook, general sales manager, gave some interesting facts about heating-cooling dealers, speaking on the subject, "Tin Knockers Aren't Dead Yet." He noted that 8 out of 10 dealers have no show room, 7 out of 10 have no training in cooling and provide no layout service, 6 out of 10 spend less than \$300 on advertising each year, and 5 out of 10 have no identification on their trucks.

At the meeting Ken Cronstrom was presented with the "Comfort Craftsman's Creed" honoring his 29 years in the industry.



NEW BUCKEYE

Now you can finish ductwork flush against the wall. New Buckeye End Boot design moves register connection from center of pipe . . . provides smooth, flat side for fast, snug installation.

Do a Better Job . . . Faster . . . Specify Buckeye Pipes and Fittings

- Metal seaming adds rigidity to collars, fittings, assures firm, lasting pipe construction.
- · Side take-offs are notched for easier connections
- · Special packing for easy identification, handling
- Buckeye Snap-Tite pipes save time, labor just push sections together, edges interlock

If your local jobber cannot supply Buckeye pipes and fittings . . . contact us directly for the name of your nearest Buckeye Jobber



BUCKEYE
897 Ingleside Columbus 8, Ohio

there's a ...

WALKER DRAFT CONTROL

for Every Heating Purpose



OVER 25,000,000

NOW IN USE

WALKER Shur-Flo DRAFT INDUCER

Saves YOU MONEY! Saves TIME! **COMBINES 2 DRAFT JOBS IN 1!**

Eliminates need for two installations by combining fan operated draft inducer with draft regulator control. Simple to install at any angle.



Dial and Pointer adjustment—simplest design, easiest to adjust, maintains positive and accurate control under widest variation of stack draft.



Universally accepted for space heaters, water heaters, trailer stoves, and all budget-priced heating equipment



TYPE BB

Extra rugged, heavy construction designed for commercial and industrial use. Actual installation proved it cut fuel costs in only three months, enough to more than pay total original investment cost.



ROYAL PURPLE MODEL

Walker's finest quality automatic draft regulator with all moving parts completely shielded from corrosion. Guaranteed performance.



WALKER BBG DOUBLE SWING CONTROL

Walker's BBG Double Swing Control
regulates updraft, dissipates downdraft in
gas-fired and combination oil-gas
fired equipment.



VENTURI TOP FOR CHIMNEY CAPS

Unique Venturi design assures positive elimination of downdraft at chimney top ... for oil, gas or coal fired chimney vents. Patented pivots, balanced construction, guarantee maintenance— free long life.



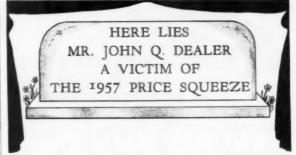
WALKER MFG. & SALES CORP.

1730 Penn Street, St. Joseph, Mo. CANADIAN DISTRIBUTORS

G. Mitchell & Co., 4215 Gascon St., Montreal, Quebec, Canada E. H. Price, Ltd., McArthur St., Winnipeg, Manitoba, Canada E. H. Price, Ltd., 83 Robson St., Vancouver, B.C., Canada

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 Automatic Draft regulators for small installations. 		
☐ Industrial Draft regulators for	NAME	
schools, buildings, plants.		
Double Swing Draft Control for Gas.		
□ Walker SHUR-FLO Draft Inducer.	ADDRESS -	
Royal Purple-Deluxe Controls for		
Deluxe Equipment.		
☐ Venturi Top Chimney Cap.	CITY	STATE



You can do more than make a customer unhappy by selling him PRICE SQUEEZE Air Conditioning and Heating Equipment . . .

You can put yourself RIGHT IN THE GRAVEYARD of dealers who went after the "quick buck" and forgot for the moment that tomorrow was another business day.

DON'T BE CAUGHT IN THE "PRICE SQUEEZE"

Get Customer Good Will and Satisfaction and Greater Profits!

YOU CAN DO THIS BY DOING BUSINESS WITH ANCHOR

- Warm Air, Wet Heat and Air Conditioning
- A brand name of quality since 1865
- Giving you a protected franchise
- Assurance of continuing customer satisfaction

Buy ALL your heating and air conditioning equipment from one source . . . America's Oldest Manufacturer of a complete line of heating and air conditioning equipment.

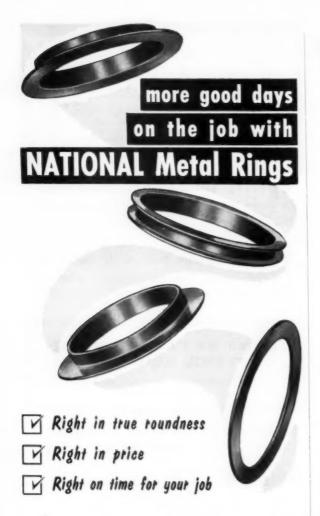
Let us prove we can increase your profits in 1957



Since 1865

Division of Stratton & Terstegge Co., Inc. P. O. Box 311 New Albany, Ind.

(



In your shop or out in the field, you can't afford to fool around with rings that don't fit. So why not turn to National, where rings are true — guaranteed to do the job without any waste of time or effort. National's in-stock service offers all the leg-out carbon steel ring sizes normally needed, ready for immediate delivery in any quantity. They're accurately rolled by experts to uniform curvature — furnished with or without bolt holes. Write today for National's list of stock sizes and discounts. You'll be following the lead of hundreds of large and small sheet metal shops everywhere.

National can roll to your specifications angles, channels, tees, rods, flat-bars, pipe and tubes. Sheet metal fabricating and assembly work is another National specialty organized for YOU. Use it as your standby facility.



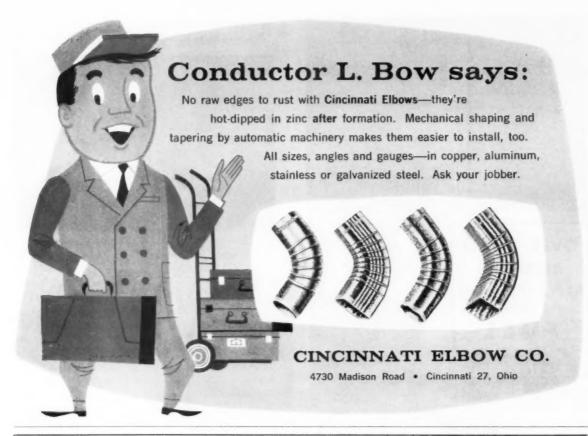
2138 South Sawyer Avenue, Chicago 23, Ill., Phone: Blshop 7-4255

wholesaler doings...



CAPACITY ATTENDANCE indicates popularity of dealer school conducted by S. S. Fretz, Jr., Inc.

- S. S. Fretz, Jr., Inc., Philadelphia Airtemp distributor, recently completed its 15th consecutive "dealer engineering school." More than 1000 sales engineers have now taken the annual course. The 1957 program, which opened the latter part of February, consisted of seven two-hour Monday evening school sessions. Subjects covered included heat gain and heat loss calculations, perimeter method load calculations, residential and commercial equipment selection, residential and commercial air conditioning system design, pricing, operating costs and allied topics.
- ▶ H. L. McMurry & Co. has been named to handle distribution throughout Florida of Buensod-Stacey dual-duct air conditioning equipment. The McMurry company has offices in Jacksonville, Miami, Tampa, Daytona Beach, and Orlando.
- ▶ H. A. McRae & Co., Troy N. Y. will handle distribution of Temco heating and cooling equipment in the Hudson Valley territory of New York state.
- ▶ Personnel of the Behler-Young Co., Grand 'Rapids, Mich. distributor, recently met with officials of Kalamazoo Furnace & Appliance Mfg. Co. at the latter's home office in Kalamazoo. C. C. Whitcomb, president of the Kalamazoo firm, was in charge of the meeting. After inspecting the 1957 line of furnaces, the group was introduced to new sales material for use in promoting sales of gas, oil and coal-fired warm air heating equipment.
- ▶ CAHN ELECTRIC Co., Inc., Shreveport, La. will handle distribution of Worthington air conditioning equipment in the northern Louisiana and southern Arkansas areas. Officers of the Cahn company are Abry S. Cahn, president; Henry E. Cahn, vice president; Abry S. Cahn, Jr., treasurer; and G. A. Burton, secretary.



BOOST YOUR PROFITS WITH G/A WARM AIR UNITS!



FLOOR FURNACE Oil-fired, 85,000 Btu.



LOWBOY
Oil-fired, 85,000 to 250,000 Btu.

For your very next installation, order a G/A quality warm air unit! No matter how tough the problem, there's a G/A unit that fills the bill! More and more people are demanding quality.

Precision engineered, G/A warm air units give years and years of customer satisfaction. And you reap a handsome profit! Write TODAY for full details!

DON'T FORGET . . .

G/A Air Conditioning units are perfect mates for the G/A warm air units.





GENERAL AUTOMATIC PRODUCTS CORP.

2300 SINCLAIR LANE

BALTIMORE 13, MARYLAND

AMERICAN ARTISAN, JUNE 1957

HORIZONTAL FURNACE

Oil-fired, 85,000 to 300,000 Btu.







ECONOMITE

POWER GAS CONVERSION BURNER

In the small home development of 472 homes in Marquette Heights, near Peoria, Illinois, illustrated above, Lo-BLAST Economite Power Gas Burners replaced oil burners originally installed. The reasons are evident when the trouble-free performance and economy of the Economite are considered.

Power burner design assures perfect combustion, regardless of natural draft conditions—saves an average of 10% in fuel—ideal for downdraft heating plants. The Economite burns so smoothly you can't tell when it's running.

Every Economite is factory-tested on gas and shipped assembled, fully equipped with fool-proof safetys.

Lo-BLAST Power Gas Burners are available in capacities from 70,000 to 20,000,000 BTU input. Write for literature.

MID-CONTINENT

METAL PRODUCTS CO. 1960 N. Clybourn Ave., Chicago 14, Ill.



DEALERS STUDY LITERATURE provided by Wheaton, Ill. wholesaler

CONTROL'D ENGINEERING SUPPLY Co., INC., Wheaton, Ill., sponsored a meeting for dealers on May 14 in Glen Ellyn. Some 130 dealer representatives heard an informative talk on cooling by Donald Bahnfleth, research associate, University of Illinois. Mr. Bahnfleth discussed factors which affect cooling loads. He pointed out that loads must be carefully calculated so that cooling equipment will be properly sized. He stressed the fact that there is no advantage in oversizing a cooling system. If the equipment is properly sized, he explained, it will operate continuously on a day meeting design temperatures. This continuous operation is essential to proper humidity control, he said.

He pointed out the importance of insulating cooling duct which passes through space which is not being conditioned. Occupants must be instructed on the proper use of their equipment, he said, if they are going to be satisfied. Cooling loads on second floors must be reduced through the use of attic fans if comfort is to be maintained, he added.

Refreshments were served after the meeting. Hal Gray served as host for the company.

- ▶ The Tri-State Equipment Co., of Preakness, N.J. has been appointed a distributor of air conditioning products by Recold Corp. The Tri-State firm, located at 65 Oakley, is owned by W. I. Freeman, Jr.
- ▶ THE EXCELSIOR STEEL FURNACE Co. has taken on the Heil Co.'s line of heating and cooling equipment, and will handle distribution in the Chicago area. Harry Mitchell is president of the Excelsior firm.
- ▶ KLEINMAN BROS., INC., 615 W. North Ave., Baltimore has been named a distributor of residential and commercial air conditioning equipment by the Mercury Air Conditioning and Heating Div., Lord and Palmer, Inc. The Kleinman firm will cover the eastern Maryland trading area.



Preferred VAST MAJORITY

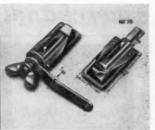
NO. 69 SET SINGLE BEARING FOR SMALL DAMPERS

Identical with No. 70 except that it is furnished with just one bearing.

HART & COOLEY

MANUFACTURING CO. 500 EAST EIGHTH ST. HOLLAND, MICH.

IN CANADA HART & COOLEY MFG. CO. FORT ERIE, N. ONTARIO



NO. 70 SET FOR LARGER DAMPERS

Has two retractable-bolt bearings. The easiest, most convenient and efficient set ever devised. Most economical, too, all things considered.









Refrigeration and Electric Motors, Too!

OVER 10,000 ITEMS ...

the world's most comprehensive listing of parts and supplies .. appear in the

Harry Alter DEPENDA-**BOOK No. 166** Summer, 1957 complete with illus-

trations, descriptions, prices and other useful information.

SAVE MONEY, time and effort by ordering the parts you need from this compact, easy-to-read, up-to-date catalog.

Write on your letterhead for the DEPENDABOOK

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WHOLESALE ONLY

The HARRY ALTER CO., Inc.

1717 S. Wabash Ave., Dept. G, Chicago 16, III.

to trust branches 134 Lafayette St. 122 Parkhouse St. 690 Stewart Ave. New York 13, N. Y. Dallas 7 Texas Atlanta 10,

and

Supplies

No. 91 Bench Punch

Jan bole thru 1/4" iron; 3/4" hole thru 3/16" iron; 2" hole thru 1/8" iron. Weight 79 lbs.

Depth of throat 5"

Stock size of round punches — 1/8" to 1" by 1/32", 1-1/16" to 2" by 1/16".

Punches also made in squares, ovals, rectangular or special shapes to customers order. Has depth gage at punch line and insert-

able pipe handle.

Also made with 10", 18" and 24" depth of throat.

Notching attachment made especially for this tool, enables the operator to notch $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{1}{8}$ " angle iron.

No. 4-B Jinner's Punch

Capacity 1/4" hole thru 16 gage iron. Length 81/2". Weight 3 lbs. Depth of throat 2". Punches and dies 1/16" to 9/32" by 1/64". Also supplied with three punches and dies in cardboard carton.



Write for cata log and see your local jobber.





Beverly Pneumatic Shears combine all the advantages of Beverly Throatless Shears with fast, effortless cutting action through air cylinder operation. Air operation speeds work, permits accurate cutting to a pattern or template, as operator can concentrate on guiding work through the shear. Flow control valves permit precise adjustment of stroke speed; adjustable actuating arm controls stroke length. Foot Switch permits operator to use both hands on the work piece. Operates on 110V. 60 cycles AC and 35 to 150 PSI air pressure.

See your nearby Beverly Distributor
Write for catalog sheet and complete details.

BEVERLY SHEAR MANUFACTURING CO.

NEW!

BITS!
THAT HAVE

"NO-SLIDE"

"NO-SLIP"



SAMSON PORTABLE ELEC. DRILL BITS — THE ONLY ONE OF ITS KIND! "No-Creep" design feature eliminates need for a prick punch — no punching or bulling.

SNAP RESISTANT design practically eliminates breakage even in $\frac{1}{8}$ " size.

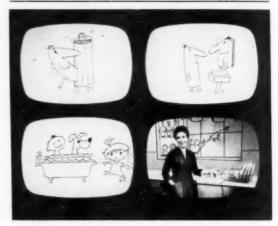
"MORE HOLES PER BIT" outlasts other makes
— 20% to 80% longer life and cost NO MORE.
See your WHOLESALER or write —

KASS Hardware & Supply Co., Inc.

443 East Tremont Ave.

Bronx 57, N. Y.

merchandising ideas



TV CARTOONS illustrate situations such as being caught in the shower without hot water, shaving with ice water, and the troubles brought on by not having sufficient hot water to meet the needs of growing families

- A SERIES of filmed TV commercials, using animated cartoon characters followed by live action sales presentations pointing out the benefits of automatic water heating is offered to dealers of John Wood Co. According to W. Glenn Oslin, vice president and general sales manager, Heater & Tank Div., the films have been produced in 20, 40 and 60 second lengths for use as TV spot announcements or as full one-minute commercials in regularly scheduled programs.
- Duro-Dyne Corp. has scheduled a series of 60 day selling periods during which advertising promotion is focused on one specific product. For example, during the months of April and May, vane rails received intensive promotion, while during June and July insulation adhesives are scheduled to be pushed. September and October have been designated flexible connector months, and during the months of November and December blade kits will be featured. During each 60 day selling period, dealers have the opportunity, through their selling performance, to win such prizes as hi-fi phonographs, portable typewriters, clock radios, home movie outfits, etc.
- BRYANT MFG. Co. is sponsoring a "Name the Bryant Pup" contest which is divided into two parts: 1) The general public gets a chance to win a gold Cadillac and 165 furnaces and water heaters; 2) Dealers get cash awards for the winning entries submitted from their showrooms. The company has prepared dealer packages covering the program which include contest entry blanks, product folders, blow-ups of contest ad, streamers, decals, a set of contest tie-in ad mat proofs. a radio spot recording, and a life size plastic model of the Bryant pup.

it only takes

to do the job of

ons with

3 or 4 operations

E-Z-ON damper regulators



Advanced design of E-Z-ON damper regulators permits on-the-job Assembly with only a hammer — no drilling — no rivets — no extra operation. This 16 gauge steel regulator is simply positioned on the damper by sliding it over the scribed center line. The E-Z-ON accurately stays in position until a hammer blow drives the sharp prongs through the damper (E-Z-ON prongs will pierce 22 gauge metal).

2 piece Combination available On small dampers the threaded head piece and wing nut

only, may be purchased.
See your jobber.

M. A. GERETT CORP.

724 W. Winnebago St. Milwaukee S, Wis.
all leading jabbers stock E-Z ON
Stocked in Canada by THERMIDAIRE CORP. 7 9 Cumberland St., Toronto

"CORRECT PRACTICE in OIL HEATING"

NOW AVAILABLE TO YOU!

A complete reprint of the valuable series

by J. J. Mirabile

This practical series covers every angle of oil burner work, including arrangement of shop . . . stocking of parts . . . record-keeping . . . installation procedures . . . the handling of crews . . . how to make heating surveys . . . how to size combustion chamber . . . how to install thermostat . . . how to start the burner . . . how to use testing instruments . . . and how to operate a service department. It contains, as well, a complete list of causes and cures of oil burner troubles that will serve as a reliable guide in making service calls.

Every shop handling oil burner jobs should own this book. Full size, 81/2 by 11 inches — 57 pages of practical helps. Send \$1.00 for a copy to the address below.

KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue

Chicago 2, III.





Less than 5 seconds on short and lighter pieces . . . Slightly longer on bulkier pieces

MAKES PERFECT DRIVE-CLEATS TOO!

The ONLY tool that does both.

A complete drive cleating tool . . .

no set-up time . . . no adjustments.

Handy to take out to the job when not needed in the shop. Turns idle time into production time. Flanges any square duct up to 20 gauge.

Quickly pays for itself in time, material and labor savings.

No. 12 Smith's Clort Bender (12" wide) . \$49.80*
No. 18 Smith's Clert Bender (18" wide) . \$78.60*
No. 24 Smith's Clert Bender (24" wide) . \$140.00

*F.O.B. Waukegan, Illinois Prices subject to change without notice

PERFECT DRIVE CLEATS fit the duct without the use of a screwdriver. TREMENDOUS SAVINGS in erection time and labor.

R. E. SMITH

1124 Elizabeth Avenue . Waukegan, Illinois

SCHAEFER BRUSHES

Clean Boilers Easier, Faster



DOUBLE STEM, HORSESHOE STYLE BOILER BRUSHES —

Long-wearing Silver-Bright Rustproof Wire resists moisture, wear. Three sizes: No. S-393, 13/4" x 4" x 51/2": No. S-394, 21/2" x 6" x 61/2": No. S-395, 31/2" x 6" x 61/2". Also in black oil tempered wire.



RECTANGULAR BOILER BRUSHES

Extra heavy filled, Silver-Bright Rustproof Wire. Metal Guards. 3 sizes: No. S-349, 2" x 4" x 6"; No. S-400, 21/2" x 41/2" x 6"; No. S-401, 3" x 5" x 6". Also in black oil tempered wire.



RECTANGULAR FLUE OR BOILER BRUSHES

Ruggedly built of durable spiraled flat steel wire, accurately trimmed. 3 sizes: No. 420, $2" \times 3^{1}/4" \times 4"$; No. 422, $1^{1}/8" \times 3^{1}/4" \times 4"$; No. 423, $2" \times 3^{1}/4" \times 5"$; No. 424, $2^{3}/4" \times 4^{1}/2" \times 6"$.

Write for special prices — and new Schaefer Flue and Furnace Brush Catalog.

Schaefer Brush MFG. CO., Inc.

117 W. Walker Street, Milwaukee 4, Wisconsin Buy Schaefer . . . It's Safer



BEST PERFORMANCE AT POPULAR PRICES
Write today for Blade and Comparison Charts. Stocked by
most jobbers in U.S. & Canada.



405 E. 48th Street Minneapolis 9, Minn.

appointments . . .

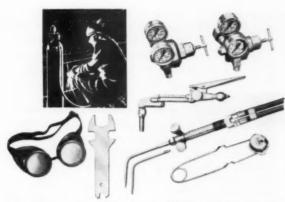




Norman F. Jones

C. B. Armour

- NORMAN F. JONES as general manager of the Lima Register Co. Before joining the Lima firm five years ago, Mr. Jones had been associated with Lennox Industries Inc. C. B. Armour, formerly district sales representative in the East, has been appointed sales manager.
- ▶ J. Alan MacDonnell as a vice president of Gilbert & Barker Mfg. Co. Mr. MacDonnell was also made a member of the company's board of directors. He was formerly general sales manager, in which capacity he is being succeeded by Lawrence Marchese, former assistant general sales manager.
- ▶ Philip A. Sprague as president of The Hays Corp. Donald R. Schoen has been named executive vice president.
- ▶ Joseph W. Greene as vice president of sales for Crane Co. Mr. Greene will head a realigned department organization which will coordinate heating and cooling sales previously conducted on a divisional basis. He will also be responsible for the direction of marketing research and advertising-sales promotion activities.
- MALCOLM SMITH as manager, sheet and strip, for the United States Steel Supply Div. Mr. Smith joined the division in 1949 as a salesman in San Francisco.
- ▶ Western Sales Service, Denver and Salt Lake City, as representative in Colorado, Utah, Wyoming, Montana and southern Idaho for Research Products Corp.
- ▶ ROBERT L. PLASKO as sales engineer handling "Globe" heating and cooling equipment for the Huppower Div. of Hupp Corp. Previously he was Michigan sales representative for the Permaglas Div. of A. O. Smith Corp.
- DONALD R. VICK as head of the newly opened Portland, Ore. branch office of Century Electric Co. The new office is located at 1238 N. W. Glisan St.



Designed for fast, low cost work in the shop...in the field

- NEW portable Airco Outfit cuts metal up to 1" steel plate, welds steel up to 3/16" thickness
- · Light weight reduces operator fatigue
- Low cost, highest quality complete welding and cutting outfit.

Over 800 Authorized Airco Dealers are ready to serve you. Check the Classified Telephone Directory under "Welding Equipment and Supplies" for the one nearest you-or-write

Airco direct for his name. Ask him about the advantages of the new Airco outfit and for details about how you can save money with the Airco Lease Cylinder Plan.



REDUCTION

A Division of Air Reduction Comp 150 East 42nd Street, New York 17, N. Y.



ACCURACY at a glance. Match static pressure drop across system's evaporator exactly to manufacturer's ratings in hundredths-of-aninch water column. Brings top system efficiency - better sales!

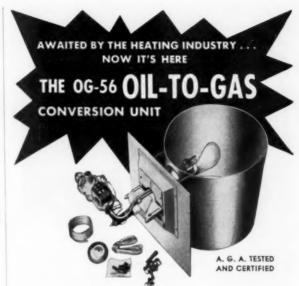
LIFETIME construction with no moving or delicate parts. Solid transparent plastic blockalmost indestructible.

COMPLETE ready-to-use pocket-size kit with gage, rubber tubing, connectors, pressure tips, spring holders, and gage oil fits into 8" x 7" plastic pouch. Ideal for field use

by engineers and installers.

WRITE FOR BULLETIN B30

MICHIGAN CITY, INDIANA P. O. BOX 373-F



Developed by a famous name in heating—Banner Burner—for oil-to-gas conversion the OG-56 is superior in design and construction . . . installs quickly, easily and profitably. Now being manufactured with these outstanding advantages:

EASY TO INSTALL—fits through four-inch oil burner sleeve!
ONE PIECE CAST IRON CONSTRUCTION of venturi and flame spreader

M. H. CONTROLS—available in Powerpile or 24-volt system. An example of the quality components throughout.

Write for complete details.

BANNER BURNER CO.

227 EAST INDIANOLA AVENUE . YOUNGSTOWN 7, OHIO

New ANEMOTHERM AIR METER gives you

Air Velocity Air Temperature Static Pressure



with

ease

The new model 60 Anemotherm Air Meter helps you balance heating, ventilating and air conditioning systems the modern pushbutton way. It puts air velocity, air temperature and static pressure at your fingertips ... pays for itself through time saved on only one major job. • Write for Bulletin 55 giving all essential data.

ANEMOSTAT CORPORATION OF AMERICA 10 EAST 39th STREET, NEW YORK 16, N. Y.

▶ EDWIN L. FACKLER as sales manager for the Anchor Div. of Stratton & Terstegge Co. Mr. Fackler was formerly assistant sales manager.





Edwin L. Fackler

Frank M. Koch

- ▶ Frank M. Koch as western district manager for Premier Co. Mr. Koch, who recently retired from General Electric Supply Co., San Francisco, after 32 years of service, will supervise sales activities for Premier in 10 western states and El Paso, Texas.
- WILLIAM OHLY as manager of distributor sales for Acro Div. of Robertshaw-Fulton Controls Co. Mr. Ohly will supervise sales to distributors of precision switches. The division, which also produces tempera-

ture controls for heating equipment, was recently acquired by Robertshaw-Fulton. James D. Crum has been assigned to the Baltimore office of the Fulton Sylphon Div. where he will serve as a sales engineer. He was formerly applications engineer in the division's headquarters at Knoxville, Tenn.

- ▶ EDWARDS AIR CONDITIONING SALES Co., 626 Broadway, Cincinnati, O. as a representative for Trion, Inc. handling the sale of electronic air cleaning units for commercial applications. Tri-State Equipment Co., with offices at 65 Oakly Way, Preakness, N. J. has also been named to represent the company.
- ▶ HUBERT R. HUNT of Tri-Cities Engineering Co. as sales representative covering the states of Virginia, West Virginia, North and South Carolina for Refrigeration Appliances, Inc. Mr. Hunt has offices at 20 Lee St., Bristol, Va.
- ▶ PRODUCT AND SALES DEVELOPMENT ASSOCIATES, Chicago as representative for Purolator Products, Inc. in the state of Ohio and certain counties of Illinois. W. I. Negle Co., Pittsburgh will cover West Virginia as well as parts of Maryland and Pennsylvania. The Halberg Co., Brooklyn has been named to cover part of the state of New York.

MORE FURNACE CLEANING PROFITS!



WM. W. MEYER & SONS, INC.

8259 Elmwood Ave.

Skokie, Illinois

THE GENERAL "SPACE SAVER" FURNACE CLEANER

For continuous, profitable operation in all kinds of weather—adds 30 to 60 more operating days to your working schedule. The entire system is built into the truck body—lets you get in off the street for jobs you couldn't take before because of space problems.

Heavy duty construction — powerful cleaning action. 40 H.P. 4 cylinder, water-cooled engine. Inlet velocity of 8500 RPM . . . 72 replaceable bags . . . 56 cu. ft. hopper capacity . . . hinged cleanout . . . filter box inlet . . . air distribution baffle, and many other items and work-saving features.

WRITE, WIRE OR PHONE TODAY for complete details, or for information on the GENERAL "GIANT" FURNACE CLEANER



Look Better — Last Longet:
Superior workmanship and finish in heavyquage metal assures installations of lesting
beauty. Most designs stamped in any thickness.
up to one-fourth inch. from any metal. Catalog
No. 36 illustrates all designs and gives complete
working data. Free on request.

Diamond Manufacturing Co. Box 34 Wyoming, Pa. West Coast Plant, Diamond Perforated Metals Co. 17915 So. Figueroe St., Gardene, Calif.





STAMPINGS & SPINNINGS

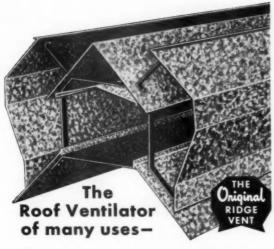
Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.

If you don't have catalog K, send for it NOW.

MILLER & DOING

89 ADAMS STREET

BROOKLYN, N. Y.



Swartwout Heat Valve

Ventilate any industrial roof with this low-friction natural-flow Heat Valve. Efficient, economical. Has large capacity per sq. ft. of opening. Throat sizes 4" to 42". Weatherproof. Compact, pleasing appearance. Many miles of this successful Swartwout ventilator in use. Write for Bulletin HV-J.

The Swartwout Company, 18511 Euclid Ave., Cleveland 12, Ohio

Swartwout ROOF VENTILATORS AND VENTILATING LOUVERS

ALSO AUTRONIC PROCESS CONTROL EQUIPMENT



PIPE and FITTINGS

Prompt, Deliveries

MONCRIEF offers a complete line of Prefabricated pipe and fittings for any type of Heating or Cooling system. All precision made, at low mass production cost. Prompt shipment from Atlanta Factory makes MONCRIEF the South's most dependable source of supply on Duct Work, Registers, Grilles and Diffusers. Save time and money by ordering from your jobber TODAY. Write for catalogue showing fittings and prices.

MONCRIEF FURNACE CO.

P. O. Box 1673 Atlanta, Ga.





PEXT0

ADJUSTABLE BAR FOLDER

Sheet metal men like the counter-balance of the folding bar...the "one-motion" speed of clamp and fold...the adjustable stop for forming any angle...with accurate hems, locks, S-clips and drive cleats.



THE PECK STOW & WILCOX COMPANY, SINCE 1781, SOUTHINGTON, CONNECTICUE, U.S.A.

Hard to

Metals

Aluminum, Cast Iron

SODER — Stainless Steel

Galvanized Metals





6702 BRYN MAWR AVENUE, CHICAGO 31, ILL.

FLOAT CONTROL VALVES

for water level control in small space

For humidifying units, pan fillers, air conditioners, coolers, air washers. Write for catalog on whole line!



No. 51: $3^3/_a$ " long, including copper float $2^1/_a$ " as $3^1/_a$ " long, including copper float $2^1/_a$ " lock nuts for mounting in 9/15" hole; or screw right into topped opening. Pressures to 85 lbs.; capacity: $1/_2$ gat. per minute at 50 lbs.

MAID-O'-MIST, Inc.
3217 NORTH PULASKI ROAD
CHICAGO 41, ILLINOIS



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Is the quick, economical way to find what you're looking for. Check the classified page each and every issue for real bargains and hard to find items. It's a quick and sensible means too, of disposing of tools, equipment, and anything else for which you no longer have use. Check the classified page for rates.

appointments

(Continued)

▶ James C. Stoner as a district sales manager in the Illinois area for Rockwell Mfg. Co.'s Delta Power Tool Div. He will make his headquarters in Chicago.





James C. Stoner

Phillip A. Kessler

- ▶ PHILLIP A. KESSLER as district manager of the new Wisconsin sales office of Palmer-Shile Co. located at 647 W. Virginia St., Milwaukee.
- THEODORE E. BRUCH as district manager for Perfection Industries Div., Hupp Corp., covering Iowa and South Dakota. Also named a district manager is John F. Platz, who will cover the southern Ohio-western Pennsylvania area. C. Adrance Montague will serve as air conditioning specialist in the Philadelphia-eastern Pennsylvania-New Jersey area, concentrating on the establishment of air conditioning wholesalers and dealers as well as working with present heating wholesalers and dealers. Mr. Montague's operations will allow district manager T. W. Russell to concentrate on large-volume dealer and builder business.
- ▶ H. J. WAFF, JR., Norfolk, Va. as sales representative for the Adams Mfg. Co. Mr. Waff will cover the states of North and South Carolina, Virginia and part of West Virginia.
- ▶ STAN OSBORNE as field representative for the Los Angeles branch of General Controls Co. Mr. Osborne was formerly with Ashburn Supply Co. where he served as sales representative covering the northern territory.
- ▶ CRAWFORD-MAZER Co. as representative handling "TiteKote" continuous galvanized sheets for Reeves Steel and Mfg. Co. Crawford-Mazer, with offices at 715 Fox Bldg., Detroit; 542 Gladstone Ave., S. E., Grand Rapids; and 1697 Brockway St., Saginaw, will cover the southern peninsula of Michigan.
- ERSKINE E. TRAYNHAM as sales representative for the Heater & Tank Div. of John Wood Co. Mr. Traynham will cover North and South Carolina as well as parts of Virginia and Tennessee. For the past six years he has represented Combustion Engineering, Inc. in the Virginia-Carolina area.

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INDEX TO ADVERTISERS

A A A Decision Co. The	Evans Corp., The George Excelsior Steel Furnace Co., The	Majestic Co., Inc., The Mastercraft Supply Co., Inc., 140 Maxwell Steel Company 146 McQuay, Inc., 102, 103 McQuay-Norris Mfg. Co., McQuay-Norris Mfg. Co., *	Standard Stamping & Perforating Co. 121 Stanley Works, The Steinen Mfg. Co., William
A & A Register Co., The		McQuay, Inc	Stewart Mfg. Co
Acro Div., Robertshaw-Fulton Controls		McQuay-Norris Mtg. Co	Stewart-Warner Corp., U. S. Ma- chine Div.
Advance Furnace Co. 80, 81	,	Mayer & Sons Inc. Wm W 176	Stic-Klip Mfg. Co., Inc
Aeronn Corp	Fallsington Mfg. Co	Mid-Continent Metal Products Co. 170	Sundstrand Hydraulic Division Surface Combustion Corp. 35, 36
Air Conditioning Div. of American Standard	Fallsington Mfg. Co. Fan-Air Company	Midco Register Corp. Mid-Continent Metal Products Co. 170 Miller & Doing 176 Minneapolis-Honeywell Regulator Co.	Sutton Corp., O. A
Air Controls Inc., Div. Cleveland	& Co Inside Front Cover	Minneapolis-Honeywell Regulator Co.	Swartwout Co., The
Heater Co. Air Control Products Inc.	Flagler Corp., The Follansbee Steel Corp.	Moncrief Furnace Co. 177	Syncromatic corp.
Air Reduction Sales Co. 175 Airtemp Div., Chrysler Corp. 145	Foliansbee Steel Corp. Fraser & Johnston Co	Morrison Products, Inc. Morrison Steel Products, Inc. 155	
Ajax Furnace Fitting Co. Div. Cin- cinnati Sheet Metal & Roofing Co. 173	Frigidaire Div., General motors Carp.	Mueller Climatrol Division of Worth-	
cinnati Sheet Metal & Roofing Co. 173		ington Corp 5	
Allen Co., Inc., L. B	G		1
Alton Mrg. Co.			Tecumseh Products Co 91
Alter Co., The Harry	Galvan Mfg. Co	N	Temco Inc.
American Brass Co., The	General Controls Company 20, 27	National Lock Company 12	Thatcher Furnace Co. 105 Thermac Company
Co. 167 Anemostat Corp. of America . 117, 175		National Lock Company 12 National Metal Fabricators 169	Thermo-Base Div., Gerwin Industries
	General Filters, Inc	National-U. S. Radiator Corp	Inc. 87 Thermo-Products, Inc.
	General Products Co	Filter Co les	Thor Metal Products Co., Inc.
Armstrong Fittings Co. Armstrong Furnace Co. 20, 21 Arno Adhesive Tapes, Inc. 10	Goodyear Tire & Rubber Co., Inc 3	N'agara Furnace Div., Forest City Foundries Co., The 139 Niagara Machine & Tool Works 99 Niagara Machine & Tool Works 99	Thor Tool & Die Co
Arno Adhesive Tapes, Inc 10	Great Western Steel Co. Greenheck Fan & Ventilator Corp.	Niagara Machine & Tool Works 99	Toridheet Division, Cleveland Steel
Auer Register Co., The 24	Gustin-Bacon Mfg. Co.	Nielsen, Inc., E. V. Nixalite Company of America	Products Corp 141
Auto Flo Corp. Automatic Humidifier Co. 150		Norman Products Company	
		Norwood Products Co., Div. of A. R.	
	н	Wood Mfg. Nu-Way Corp. 9, 148	
B	Hall-Neal Furnace Co 85		U
Bacharach Industrial Instrument Co. 6	Hart & Cooley Mfg. Co		United States Register Co 78
Ranner Rumer Company 175	Hastings Air Controls, Inc.		United Sheet Metal Co., The
Barber-Colman Co	Heil Co., The 106 Henry Furnace Co., The 98 Hexdall Co., A. M. 9 Hussey & Co., C. G. 34	0	U. S. Steel Corp
Baso Inc	Hexdall Co. A. M.	Oisen Mfg. Co., C. A., The	U. S. Steel Supply Div., United States Steel Corp. 79
Bethlehem Steel Co	Hussey & Co., C. G 34	Ohio Valley Hardware Co., Inc *	Utility Appliance Corp.
Bett-Marr Manufacturing Co			Utility Fan Corp
Beverly Shear Mfg. Co. 172 Black & Decker Mfg. Co., The 115			
Bostitch, Inc. Boston Machine Works Co. Brundage Co. Brundage Co. 133	1	P	
Brundage Co	Independent Register Co., The 128	Parker-Kalon Div., General American	
Buckeye Furnace Pipe Company 166	Ingersoll Conditioned Air Div., Borg-	Parker-Raidii Div., delicial American	V
manuals ranners ribs comband 200	Ingerson constituted but one, doing	Transportation Corp.	•
and the same of the company to the company	Warner Corn 107	Transportation Corp. Patter Co., J. V. 160 Pack Stow & Wilson Co. The 179	Van Packer Co. Div. of Flintkote Co. 149
and the second s	Warner Corp. 107 Ingersoil-Rand Company 177 Inland Steel Co 118, 119	Peck, Stow & Wilcox Co., The 178	Van Packer Co. Div. of Flintkote Co. 149 Viking Air Products Div. of The
c	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22	Peck, Stow & Wilcox Co., The 178	Viking Air Products Div. of The National—U. S. Radiator Corp.
c	Warner Corp. 107 Ingersoil-Rand Company 177 Inland Steel Co 118, 119	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries Div. of Hugo.	Viking Air Products Div. of The National—U. S. Radiator Corp.
Carey Electronic Engineering Co.	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries Div. of Hugo.	Viking Air Products Div. of The
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Premier Co.	Viking Air Products Div. of The National—U. S. Radiator Corp.
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Central-West Machinery Co.	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152	Viking Air Products Div. of The National—U. S. Radiator Corp.
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Central-West Machinery Co. 179 Century Electric Co. 37	Warner Corp. 107 Ingersol-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co.	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Premier Co.	Viking Air Products Div. of The National—U. S. Radiator Corp.
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Central-West Machinery Co. 179 Century Electric Co. 37	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 178 Janitrol Heating & Air Conditioning Div. Surface Combustion Corp. 35, 36	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 179
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Central-West Machinery Co. 179 Century Electric Co. 37	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 179 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 179 W Walker Mfg. & Sales Corp. 167 Wallace Co. William
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Carp. 16, 17, 122 Central-West Machinery Co. 179 Century Electric Co. 37 Century Eng. Corp. Champion Furnace Pipe Co. 8 Char-Gale Mfg. Co. 83 Cheisea Fan & Blower Co. Inc. 138 Chevrolet Motor Div. General Motor	Warner Corp. 107 Ingersolf-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manwile Johnson Ladder Shoe Co. 179 Johnson Gas Apoliance Co. 179	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 179 W Walker Mfg. & Sales Corp. 167 Wallace Co., William 8 Washington Steel Corp. 8
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Central-West Machinery Co. 179 Century Electric Co. 37 Century Eng. Corp. Champion Furnace Pipe Co. 88 Cher-Gale Mfg. Co. Cher John Co. Cher John Co. Corp.	Warner Corp. 107 Ingersolf-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 179 W Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. Waterloo Register Co. 113 Waterman-Waterbury Co., The
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Centro Electric Co. Central-West Machinery Co. Centry Electric Co. Champion Furnace Pipe Co. St. Champion Furnace Pipe Co. E. Champion Furnace Pipe Co. St. Corp. Corp. Corp. Cincinnati Elbow Co., The	Warner Corp. 107 Ingersolf-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manwile Johnson Ladder Shoe Co. 179 Johnson Gas Apoliance Co. 179	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 179 Walker Mfg. & Sales Corp. 167 Walker Co., William washington Steel Corp. 113 Waterlon Register Co. 113 Waterman-Waterbury Co., The webster Electric Company
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Centro Electric Co. Central-West Machinery Co. Centry Electric Co. Champion Furnace Pipe Co. St. Champion Furnace Pipe Co. E. Champion Furnace Pipe Co. St. Corp. Corp. Corp. Cincinnati Elbow Co., The	Warner Corp. 107 Ingersolf-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Pen Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 179 W Walker Mfg. & Sales Corp. 167 Wallace Co., William 87 Washington Steel Corp. 113 Waterloo Register Co. 113 Waterloo Register Co. 113 Waterloo Steel Corp. 113 Waterloo Steel Corp. 113 Waterloo Steel Co. 113 Waterloo Steel Co. 113 Waterloo Steel Co. 113
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Carrier Corp. Century Electric Co. Century Electric Co. Contury Eng. Corp. Champion Furnace Pipe Co. Rangele Mfg. Co. Corp. Cincinnati Elbow Co., The Cincinnati Shaper Co. Clarge Fan Co. Coleman Co., Inc., The	Warner Corp. 107 Ingersolf-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Pen Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 179 W Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. Waterloo Register Co. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. Westinghouse Electric Corp., Air Conditioning Div. 24, 25
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 37 Century Electric Co. 37 Century Electric Co. 37 Champion Furnace Pipe Co. 8 Char-Gale Mfg. Co. 10c. 138 Chelsea Fan & Blower Co., Inc. 138 Chevrolet Motor Div., General Motors Corp. 223 Clincinnati Elbow Co., The 169 Clincinnati Shaper Co. 95 Clincinnati Shaper Co. 95 Coleman Co. 10c., The Cole-Sewell Engineering Co. 38	Warner Corp. 107 Ingersolf-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 168 J Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77 Juniper Elbow Co., Inc. 179	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Pen Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 179 Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. ditioning Div. 24, 25 Wheeling Corrunating Co. 110
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 179 Century Electric Co. 37 Century Electric Co. 37 Century Eng. Corp. 8 Champion Furnace Pipe Co. 18 Champion Furnace Pipe Co. 18 Chesse Fan & Blower Co., Inc. 138 Chevolet Motor Div., General Motors Corp. 100 Cincinnati Shaper Co. 169 Cincinnati Shaper Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 26 Conco Engineering Works Condensation Engrg, Corp. 26 Coopela Refriceration Corp. 26	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 179 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Landder Shoe Co. 179 Johnson Gas Appliance Co. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg.	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Pen Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 179 Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. ditioning Div. 24, 25 Wheeling Corrunating Co. 110
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Carrier Corp. Century Electric Co. Champion Furnace Pipe Co. Signature Corp. Champion Furnace Pipe Co. Champion Furnace Pipe Co. Charge Implementation of Champion Corp. Corp. Corp. Clarage Fan Co. Clarage Fan Co. Clarage Fan Co. Cole-Sewell Engineering Co. Conco Engineering Works Condensation Engray Corp. Copeland Refrigeration Corp. Cox Mfq. Co.	Warner Corp. 107 Ingersolf-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Landder Shoe Co. 179 Johnson Gas Appliance Co. 179 Jones & Laughlin Steel Corp. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. 127 Co. 177 Co. 177 Cass Marthuare & Supply Co. 187 Cass Marthuare & Co. 187 Cass Marthuare & Supply Co. 187 C	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Peerless Corp., The Pen Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Quickdraft Co. Quiet Automatic Burner Corp. 8 Radiant Utilities Corp. 151	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 W Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 18 Waterlon Register Co. 113 Waterman-Waterbury Co., The Wester Electric Company Weirton Steel Co. 25 Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co. Outside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co.
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 179 Century Electric Co. 37 Century Electric Co. 37 Century Eng. Corp. 8 Champion Furnace Pipe Co. 18 Champion Furnace Pipe Co. 18 Chesse Fan & Blower Co., Inc. 138 Chevolet Motor Div., General Motors Corp. 100 Cincinnati Shaper Co. 169 Cincinnati Shaper Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 26 Conco Engineering Works Condensation Engrg, Corp. 26 Coopela Refriceration Corp. 26	Warner Corp. 107 Ingersolf-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Landder Shoe Co. 179 Johnson Gas Appliance Co. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. 127 Kass Hardware & Supply Co., Inc. 127 Kass Hardware & Supply Co., Inc. 127 Kass Hardware & Supply Co., Inc. 127 Keeney Mfg. Co., The 128 Kinete Company Co. 188 Kinete Company Co. 18	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Quickdraft Co. Quiet Automatic Burner Corp. 151 Radiant Utilities Corp. 151 Research Products Corp. 151 Research Products Corp. 151	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 W Walker Mfg. & Sales Corp. 167 Wallace Co., William 8 Washington Steel Corp. 113 Waterloo Register Co. 113 Waterloo Register Co. 113 Waterloo Steel Corp. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co. Outside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. 8 Williamson Co., The
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 379 Century Electric Co. 37 Century Eng. Corp. Champion Furnace Pipe Co. 8 Char-Gale Mfg. Co. 108 Chesse Fan & Blower Co., Inc. 138 Chevolet Motor Div., General Motors Corp. 122 Cincinnati Elbow Co., The 169 Cincinnati Shaper Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 95 Conce Engineering Co. 20 Conce Engineering Co. 20 Conce Engineering Co. 20 Conce Engineering Corp. 26 Cox Mfg. Co. 143	Warner Corp. 107 Ingersolf-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Landder Shoe Co. 179 Johnson Gas Appliance Co. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. 127 Kass Hardware & Supply Co., Inc. 127 Kass Hardware & Supply Co., Inc. 127 Kass Hardware & Supply Co., Inc. 127 Keeney Mfg. Co., The 128 Kinete Company Co. 188 Kinete Company Co. 18	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Quickdraft Co. Quiet Automatic Burner Corp. 151 Research Products Corp. 179 Reiner & Campbell Co., Inc. 179 Republic Steel Corp. 179	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 W Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waterloo Register Co. 113 Waterloo Register Co. 113 Waterloo Register Co. 128 Waterloo Steel Corp. Air Conditioning Div. 24, 25 Wheeling Corrupating Co. 110 White-Rodgers Co. 0utside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp.
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 379 Century Electric Co. 37 Century Eng. Corp. Champion Furnace Pipe Co. 8 Char-Gale Mfg. Co. 108 Chesse Fan & Blower Co., Inc. 138 Chevolet Motor Div., General Motors Corp. 122 Cincinnati Elbow Co., The 169 Cincinnati Shaper Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 95 Conce Engineering Co. 20 Conce Engineering Co. 20 Conce Engineering Co. 20 Conce Engineering Corp. 26 Cox Mfg. Co. 143	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 International Heater Co. 179 Janitrol Heating & Air Condition ng Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. 127 Kass Hardware & Supply Co., Inc. 172 Keneny Mfg. Co., The 12 Kirk & Blum Mfg. Co., The 18 Krueer Air Conditioning Corp. 162	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Pen Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Quickdraft Co. Quiet Automatic Burner Corp. 151 Research Products Corp. 181 Research Products Corp. 179 Republic Steel Corp. 179 Republic Steel Corp. 181 Research Products Corp. 181 Research Products Corp. 179 Republic Steel Corp. 181 Research Products Corp. 181 Research Rese	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 W Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrupating Co. 110 White-Rodgers Co. Outside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp. Wiss & Sons Co., The 147
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 379 Century Electric Co. 37 Century Eng. Corp. Champion Furnace Pipe Co. 8 Char-Gale Mfg. Co. 108 Chesse Fan & Blower Co., Inc. 138 Chevolet Motor Div., General Motors Corp. 122 Cincinnati Elbow Co., The 169 Cincinnati Shaper Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 95 Conce Engineering Co. 20 Conce Engineering Co. 20 Conce Engineering Co. 20 Conce Engineering Corp. 26 Cox Mfg. Co. 143	Warner Corp. 107 Ingersolf-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Landder Shoe Co. 179 Johnson Gas Appliance Co. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. 127 Kass Hardware & Supply Co., Inc. 127 Kass Hardware & Supply Co., Inc. 127 Kass Hardware & Supply Co., Inc. 127 Keeney Mfg. Co., The 128 Kinete Company Co. 188 Kinete Company Co. 18	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Premier Co. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Quickdraft Co. Quiet Automatic Burner Corp. 151 Research Products Corp. 151 Research Mig. Co. 179 Republic Steel Corp. 181, 19 Rezor Mig. Co. 13, 125	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 W Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 18 Waterlon Register Co. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co. Outside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp. 136 Wisson, Sons Co., The 147 Wood Co., John 136 Worcester Brush & Scraper Co. Div.
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Carrier Corp. Century Electric Co. Champion Furnace Pipe Co. Carp. Corp. Corp. Corp. Corp. Clarage Fan Co. Clarage Fan Co. Colesman Co., Inc., The Cole-Sewell Engineering Co. Conco Engineering Works Condensation Engra Corp. Copeland Refrigeration Corp. Cox Mfg. Co. Cax Mfg. Co. Cax Mfg. Co. Crane Co. Cax Mfg. Co. Cax Mfg. Co. Crane Co. Cax Mfg. Co. Crane Co. Cax Mfg. Co. Crane Co. Cax Mfg. Co. Cax Mf	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 International Heater Co. 179 Janitrol Heating & Air Condition ng Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. 127 Kass Hardware & Supply Co., Inc. 172 Keneny Mfg. Co., The 12 Kirk & Blum Mfg. Co., The 18 Krueer Air Conditioning Corp. 162	Peck, Stow & Wilcox Co., The 178 Peerless Corp., The Peerless Corp., The Peerless Corp., The Pen Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Quickdraft Co. Quiet Automatic Burner Corp. 151 Research Products Corp. 152 Research Products Corp. 151 Research Products Corp. 152 Research Products Corp. 151 Research Products Corp. 152 Research Products Corp. 153 Research Products Corp. 153 Research Products Corp. 153 Research Products Corp. 154 Research Products Corp. 155 Research Product	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 W Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waterloo Register Co. 120 Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co. 0utside Back Cover Whitney Mfg. Co., W. A. 171 Whod Co., John 136 Worcester Brush & Scraper Co. Div. Mason-Worcester Brush & Scraper Co. Div. Mason-Worcester Brush Co. 18
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Carrier Corp. Century Electric Co. Champion Furnace Pipe Co. Carp. Corp. Corp. Corp. Clarage Fan Co. Clarage Fan Co. Cole-Sewell Engineering Co. Conco Engineering Works Condensation Engra Corp. Copeland Refrigeration Corp. Cox Mfg. Co. Cax Mfg. Co. Crane Co. Corp. Detroit Controls Corp. Diamond Calk Horseshpe Co.	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77 Jones & Laughlin Steel Corp. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. 127 Kass Hardware & Supply Co., Inc. 172 Keeney Mfg. Co., The Kinetic Chemical Div., du Pont De Nemours & Co., Inc., E 1 Kirk & Blum Mfg. Co., The Krueger Air Conditioning Corp. 162 Krueger Air Conditioning Corp. 162 Krueger Sentry Gauge Co. 182	Peck, Stow & Wilcox Co., The 178 Peerfess Electric Co., The Peerfess Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Quickdraft Co. Quiet Automatic Burner Corp. 151 Research Products Corp. 152 Research Products Corp. 153 Research Products Corp. 154 Research Products Corp. 152 Research Products Corp. 153 Research Products Corp. 154 Research Products Corp. 154 Research Products Corp. 155	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 W Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 18 Waterlon Register Co. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co. Outside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp. 136 Wisson, Sons Co., The 147 Wood Co., John 136 Worcester Brush & Scraper Co. Div.
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Carrier Corp. Century Electric Co. Champion Furnace Pipe Co. Carp. Corp. Corp. Corp. Clarage Fan Co. Clarage Fan Co. Cole-Sewell Engineering Co. Conco Engineering Works Condensation Engra Corp. Copeland Refrigeration Corp. Cox Mfg. Co. Cax Mfg. Co. Crane Co. Corp. Detroit Controls Corp. Diamond Calk Horseshpe Co.	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77 Jones & Laughlin Steel Corp. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. 127 Kass Hardware & Supply Co., Inc. 172 Keeney Mfg. Co., The Kinetic Chemical Div., du Pont De Nemours & Co., Inc., E 1 Kirk & Blum Mfg. Co., The Krueger Air Conditioning Corp. 162 Krueger Air Conditioning Corp. 162 Krueger Sentry Gauge Co. 182	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waternan-Waterbury Co., The Webster Electric Company Weirton Steel Co. Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co., Dutside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp. Wiss & Sons Co., The 147 Wood Co., John 136 Worcester Brush & Scraper Co. Div. Mason-Worcester Brush & Scraper Co. Worthington Corp. Wysong & Miles Co.
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 379 Century Electric Co. 37 Century Electric Co. 37 Century Eng. Corp. Champion Furnace Pipe Co. 8 Char-Gale Mfg. Co. 108 Chesse Fan & Blower Co., Inc. 138 Chevolet Motor Div., General Motors Corp. Corp. 122 Cincinnati Elbow Co., The 169 Cincinnati Shaper Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 8 Conco Engineering Works Condensation Engrg. Corp. 6 Copeland Refrigeration Corp. 26 Cox Mfg. Co. 143 Crescent Tool Co. 88	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Landder Shoe Co. 179 Johnson Gas Appliance Co. 77 Johnson Gas Appliance Co. 179 Johnson Etaughlin Steel Corp. 179 K Kalamazoo Furnace & Appliance Mfg. Co. 179 Kass Hardware & Supply Co., Inc. 172 Keeney Mfg. Co., The Kinetic Chemical Div., du Pont De Nemours & Co., Inc. E. Kirk & Blum Mfg. Co., The Krueger Air Conditioning Corp. 162 Krueger Sentry Gauge Co. 97	Peck, Stow & Wilcox Co., The 178 Peerfess Electric Co., The Peerfess Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Quickdraft Co. Quiet Automatic Burner Corp. 151 Research Products Corp. 152 Research Products Corp. 153 Research Products Corp. 154 Research Products Corp. 152 Research Products Corp. 153 Research Products Corp. 154 Research Products Corp. 154 Research Products Corp. 155	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waternan-Waterbury Co., The Webster Electric Company Weirton Steel Co. Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co., Dutside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp. Wiss & Sons Co., The 147 Wood Co., John 136 Worcester Brush & Scraper Co. Div. Mason-Worcester Brush & Scraper Co. Worthington Corp. Wysong & Miles Co.
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Carrier Corp. Century Electric Co. Champion Furnace Pipe Co. Sa Chelsea Fan & Blower Co., Inc. Carp. Carp. Carp. Carp. Carp. Clarage Fan Co. Conco Engineering Co. Conco Engineering Corp. Copeland Refrigeration Corp. Cox Mfg. Co. Crane Co. Carme Co. Crane Co.	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 Janitrol Heating & Air Condition in Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77 Johnson Gas Appliance Co. 179 Johnson Etaughlin Steel Corp. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. 179 Keeney Mfg. Co. 78 Kinetic Chemical Div., du Pont De Nemours & Co., Inc. 172 Keeney Mfg. Co. 78 Kirk & Blum Mfg. Co. 79 Levow, David 97 Levow, D	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waternan-Waterbury Co., The Webster Electric Company Weirton Steel Co. Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co., Dutside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp. Wiss & Sons Co., The 147 Wood Co., John 136 Worcester Brush & Scraper Co. Div. Mason-Worcester Brush & Scraper Co. Worthington Corp. Wysong & Miles Co.
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Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 379 Century Electric Co. 37 Century Electric Co. 37 Century Eng. Corp. Champion Furnace Pipe Co. 8 Char-Gale Mfg. Co. 108 Chesse Fan & Blower Co., Inc. 138 Chevolet Motor Div., General Motors Corp. Corp. 122 Cincinnati Elbow Co., The 169 Cincinnati Shaper Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 8 Conco Engineering Works Condensation Engrg. Corp. 6 Copeland Refrigeration Corp. 26 Cox Mfg. Co. 143 Crescent Tool Co. 88	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 179 Johnson Gas Appliance Co. 179 Jones & Laughlin Steel Corp. 77 Juniper Elbow Co., Inc. 172 Keneny Mfg. Co., The Kinetic Chemical Div., du Pont De Nemours & Co., The Kinetic Chemical Div., du Pont De Nemours & Co., The Kirk & Blum Mfg. Co. The Kirk & Blum Mfg. Co. The Krueger Air Conditioning Corp. 162 Krueger Sentry Gauge Co. 97 Levow, David Lennox Industries, Inc. 97 Lessie Welding Co., Inc. 162 Leslie Welding Co., Inc. 163 Little Giant Vaporiore Co. 136 Little Giant Vaporiore Co. 136 Little Giant Vaporiore Co. 136	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 WW Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waternan-Waterbury Co., The Webster Electric Company Weirton Steel Co. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co. Outside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Williamson Co., The Williamson Co., The Williamson Co., The Milliamson Co., John 147 Wood Co., John 136 Worcester Brush & Scraper Co. Div. Mason-Worcester Brush & Scraper Co. Worthington Corp. Wysong & Miles Co.
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Carrier Corp. Century Electric Co. Champion Furnace Pipe Co. Sa Chelsea Fan & Blower Co., Inc. Carp. Carp. Carp. Carp. Carp. Clarage Fan Co. Conco Engineering Co. Conco Engineering Corp. Copeland Refrigeration Corp. Cox Mfg. Co. Crane Co. Carme Co. Crane Co.	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 179 Johnson Gas Appliance Co. 179 Jones & Laughlin Steel Corp. 77 Juniper Elbow Co., Inc. 172 Keneny Mfg. Co., The Kinetic Chemical Div., du Pont De Nemours & Co., The Kinetic Chemical Div., du Pont De Nemours & Co., The Kirk & Blum Mfg. Co. The Kirk & Blum Mfg. Co. The Krueger Air Conditioning Corp. 162 Krueger Sentry Gauge Co. 97 Levow, David Lennox Industries, Inc. 97 Lessie Welding Co., Inc. 162 Leslie Welding Co., Inc. 163 Little Giant Vaporiore Co. 136 Little Giant Vaporiore Co. 136 Little Giant Vaporiore Co. 136	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Quickdraft Co. Quick Automatic Burner Corp. 151 Radiant Utilities Corp. 151 Research Products Corp. 151 Research Mig. Co. 152 Revere Copper & Brass, Inc. 18, 19 Revere	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 W Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. Westinghouse Electric Company Weirton Steel Co. Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co. Outside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., The Williamson Co., The Wilson, Inc., Grant Windmaster Corp. 136 Wilson, Inc., Grant 136 Worcester Brush & Scraper Co. Div., Mason-Worcester Brush & Scraper Co. Div., Mason-Worcester Brush Co. Worthington Corp. 136 Wysong & Miles Co. 158 X XXXth Century Heating & Ventilating
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 37 Century Electric Co. 37 Century Electric Co. 37 Century Eng. Corp. 8 Champion Furnace Pipe Co. 183 Chelsea Fan & Blower Co., Inc. 183 Chelsea Fan & Blower Co., Inc. 183 Chevrolet Motor Div., General Motors Corp. 123 Cincinnati Elbow Co., The 169 Cincinnati Shaper Co. 95 Coleman Co., Inc., The 169 Coles-Sewell Engineering Co. 36 Conce Engineering Works Concernsation Engra. 26 Cox Mfg. Co. 143 Crescent Tool Co. 188 Debetroit Controls Corp. 188 Detroit Controls Corp. 188 Detroit Controls Corp. 191 Diamond Mfg. Co. 176 Dieckmann Co., Ferdinand, The 156 Dodge Corp., F. W. 84 Dreis & Krump Mfg. Co. 144 Duro-Dyne Corp. 126 Dwyer Mfg. Co., F. W. 175	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 International Heater Co. 161 Janitrol Heating & Air Condition ing Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77 Johnson Gas Appliance Co. 179 Johnson Etaughlin Steel Corp. 77 Juniper Elbow Co., Inc. 179 K K Kalamazoo Furnace & Appliance Mfg. Co. 179 Kass Hardware & Supply Co., Inc. 172 Keeney Mfg. Co. 78 Kinetic Chemical Div., du Pont De Nemours & Co., Inc. E. 1 Kirk & Blum Mfg. Co. 78 Kirk & Blum Mfg. Co. 78 Krueger Air Conditioning Corp. 162 Krueger Sentry Gauge Co. 179 Lau Blower Co. 97 Lewow, David Lennox Industries, Inc. 181 Lestie Welding Co., Inc. 181	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 Waker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co., Dutside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp. Wiss. & Sons Co., The 147 Wood Co., John 136 Worcester Brush & Scraper Co. Div., Mason-Worcester Brush & Scraper Co. Wysong & Miles Co. 134 XXXth Century Heating & Ventilating Co. 134
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. Carrier Corp. Century Electric Co. Carp. Champion Furnace Pipe Co. Bachar-Galle Mfg. Co. Crop. Corp. Cincinnati Elbow Co., Inc. Clarage Fan & Blower Co., Inc. Clarage Fan Co. Concevel Engineering Co. Concevel Engineering Co. Conco Engineering Works Condensation Engra. Concevel Engineering Corp. Conco Engineering Corp. Cox Mfg. Co. Crame Co. Cax Mfg. Co. Crame Co. Cox Mfg. Co. Crame Co. Cox Mfg. Co. Crame Co. Crame Co. Diamond Calk Horseshoe Co. Diamond Mfg. Co. Diekmann Co., Ferdinand, The Dodge Corp., F. W. Dreis & Krump Mfg. Co. Dreye Corp. Dwyer Mfg. Co., F. W. 175	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 International Heater Co. 161 International Heater Co. 161 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 27 Johnson Gas Appliance Co. 179 K K Kalamazoo Furnace & Appliance Mfg. Co. 170 K Kalamazoo Furnace & Appliance Mfg. Co. 170 K Kalamazoo Furnace & Supply Co. Inc. 172 Keeney Mfg. Co. 7he Kirk & Blum Mfg. Co. 7he Kirk & Blum Mfg. Co. 7he Kirk & Blum Mfg. Co. 7he 162 Krueger Air Conditioning Corp. 162 Krueger Air Conditioning Corp. 162 Krueger Sentry Gauge Co. 179 Lau Blower Co. 97 Levow, David 179 Lesie Welding Co. Inc. 179 Little Giant Vaporizer Co. 154 Lockformer Co. 7he 7 L. 0. F. Glass Fibers Co. 189	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Radiant Utilities Corp. 154 Research Products Corp. 155 Research Products Corp. 157 Respective Corp. 158 Research Products Corp. 179 Republic Steel Corp. 189 Revere Cooper & Brass, Inc. 18, 19 Remor Mfg. Co. 13, 125 Richmond Plumbing Fixtures Div. Rheem Mfg. Co. Round Oak Company Royal Products Co. Ryerson & Son, Inc., Jos. T. 38 Schaefer Brush Mfg. Co. 174 Sequola Mfg. Co. 174	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. 24, 25 Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co., Dutside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp. Wiss & Sons Co., The 147 Wood Co., John 136 Worcester Brush & Scraper Co. Div., Mason-Worcester Brush & Scraper Co. Wysong & Miles Co. 134 XXXth Century Meating & Ventilating Co. 134
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 377 Century Electric Co. 37 Century Electric Co. 37 Century Eng. Corp. 83 Cheisea Fan & Blower Co., Inc. 138 Chevolet Motor Div., General Motors Corp. 122 Cincinnati Elbow Co., The 169 Cincinnati Shaper Co. 95 Cincinnati Shaper Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 86 Comoc Engineering Works Condensation Engrg. Corp. 87 Corpeland Refrigeration Corp. 96 Corane Co. 143 Crescent Tool Co. 143 Crescent Tool Co. 176 Dieckmann Co., Ferdinand, The 156 Dodge Corp., F. W. 88 Deris & Krump Mfg. Co. 144 Duro-Dyne Corp. 126 Dwyer Mfg. Co., F. W. 175 E E Electro-Air Cleaner Co. 142	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 179 Janitrol Heating & Air Condition ng Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. The 172 Kass Hardware & Supply Co., Inc. 172 Kass Hardware & Supply Co., Inc. 172 Keneny Mfg. Co., The 187 Kinetic Chemical Div., du Pont De Nemours & Co., Inc., E. I. Kirk & Blum Mfg. Co., The 28 Krueger Air Conditioning Corp. 162 Krueger Sentry Gauge Co. 97 Levow, David Lenox Industries, Inc. 67 Lenox Industries, Inc. 68 Lennox Ind	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc. 111, 112 Perfection Industries, Div. of Hupp Corp. Pringle & Son, R. A. Pullman Vacuum Cleaner Corp. 152 Purolator Products Inc. 153 Radiant Utilities Corp. 154 Research Products Corp. 155 Research Products Corp. 157 Respective Corp. 158 Research Products Corp. 179 Republic Steel Corp. 189 Revere Cooper & Brass, Inc. 18, 19 Remor Mfg. Co. 13, 125 Richmond Plumbing Fixtures Div. Rheem Mfg. Co. Round Oak Company Royal Products Co. Ryerson & Son, Inc., Jos. T. 38 Schaefer Brush Mfg. Co. 174 Sequola Mfg. Co. 174	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 Walker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. 24, 25 Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co., Dutside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp. Wiss & Sons Co., The 147 Wood Co., John 136 Worcester Brush & Scraper Co. Div., Mason-Worcester Brush & Scraper Co. Wysong & Miles Co. 134 XXXth Century Meating & Ventilating Co. 134
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 37 Century Electric Co. 37 Century Electric Co. 37 Century Eng. Corp. 8 Champion Furnace Pipe Co. 18 Chesse Fan & Blower Co., Inc. 18 Chevrolet Motor Div., General Motors Corp. 123 Cincinnati Elbow Co., The 169 Cincinnati Shaper Co. 95 Coleman Co., Inc., The 169 Cincinnati Shaper Co. 95 Coleman Co., Inc., The 201 Conce Engineering Co. 36 Conce Engineering Corp. 26 Cox Mfg. Co. 143 Crescent Tool Co. 143 Crescent Tool Co. 176 Dieckmann Co., Ferdinand, The 156 Dodge Corp., F. W. 84 Dreis & Krump Mfg. Co. 144 Duro-Dyne Corp. 126 Dwyer Mfg. Co., F. W. 175 E E Electro-Air Cleaner Co. 142 Elgen Mfg. Corp. 165	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 179 Janitrol Heating & Air Condition ng Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77 Juniper Elbow Co., Inc. 179 K Kalamazoo Furnace & Appliance Mfg. Co. The 172 Kass Hardware & Supply Co., Inc. 172 Kass Hardware & Supply Co., Inc. 172 Keneny Mfg. Co., The 187 Kinetic Chemical Div., du Pont De Nemours & Co., Inc., E. I. Kirk & Blum Mfg. Co., The 28 Krueger Air Conditioning Corp. 162 Krueger Sentry Gauge Co. 97 Levow, David Lenox Industries, Inc. 67 Lenox Industries, Inc. 68 Lennox Ind	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 Waker Mfg. & Sales Corp. 167 Wallace Co., William Washington Steel Corp. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co., Dutside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. Williamson Co., The Wilson, Inc., Grant Windmaster Corp. Wiss & Sons Co., The 147 Wood Co., John 136 Worcester Brush & Scraper Co. Div., Mason-Worcester Brush & Scraper Co. worthington Corp. Wysong & Miles Co. 134
Carey Electronic Engineering Co. Metal Wool Div. Carlin Co., The Carrier Corp. 16, 17, 122 Central-West Machinery Co. 377 Century Electric Co. 37 Century Electric Co. 37 Century Eng. Corp. 83 Cheisea Fan & Blower Co., Inc. 138 Chevolet Motor Div., General Motors Corp. 122 Cincinnati Elbow Co., The 169 Cincinnati Shaper Co. 95 Cincinnati Shaper Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 95 Coleman Co., Inc., The Cole-Sewell Engineering Co. 86 Comoc Engineering Works Condensation Engrg. Corp. 87 Corpeland Refrigeration Corp. 96 Corane Co. 143 Crescent Tool Co. 143 Crescent Tool Co. 176 Dieckmann Co., Ferdinand, The 156 Dodge Corp., F. W. 88 Deris & Krump Mfg. Co. 144 Duro-Dyne Corp. 126 Dwyer Mfg. Co., F. W. 175 E E Electro-Air Cleaner Co. 142	Warner Corp. 107 Ingersoll-Rand Company 177 Inland Steel Co. 118, 119 Inland Steel Products Co. 22 Insto-Gas Corp. 161 International Heater Co. 161 International Heater Co. 161 International Heater Co. 161 International Heater Co. 179 Janitrol Heating & Air Conditioning Div., Surface Combustion Corp. 35, 36 Johns-Manville Johnson Ladder Shoe Co. 179 Johnson Gas Appliance Co. 77 Johnson Gas Appliance Co. 179 Johnson Gas Appliance Co. 179 Johnson Etaughlin Steel Corp. 77 Juniper Elbow Co., Inc. 172 Kasharaware & Supply Co., Inc. 172 Keeney Mfg. Co., The Kinetic Chemical Div., du Pont De Nemours & Co., Inc., E. I. Kirk & Blum Mfg. Co., The Krueger Air Conditioning Corp. 162 Krueger Sentry Gauge Co. 97 Levow, David Lennox Industries, Inc. 97 Leslie Welding Co., Inc. 68 Leslie Wel	Peck, Stow & Wilcox Co., The 178 Peerless Electric Co., The Peerless Corp., The Penn Controls, Inc	Viking Air Products Div. of The National—U. S. Radiator Corp. 158, 159 Vyke Manufacturing Co. 158, 159 Vyke Manufacturing Co. 158, 159 Walker Mfg. & Sales Corp. 167 Wallace Co. William Washington Steel Corp. 18 Waterlon Register Co. 113 Waterman-Waterbury Co., The Webster Electric Company Weirton Steel Co. 10 Westinghouse Electric Corp., Air Conditioning Div. 24, 25 Wheeling Corrugating Co. 110 White-Rodgers Co. Outside Back Cover Whitney Mfg. Co., W. A. 171 Whitney Mfg. Co., W. A. 171 Whitney Metal Tool Co. 10 Williamson Co., The 147 Wisson, Inc., Grant 136 Wordester Brush & Scraper Co. Div., Mason-Worcester Brush & Scraper Co. Worthington Corp. Wysong & Miles Co. 134

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